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DEPARTMENT OF THE INTERIOR

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**COMMERCIAL FISHERIES REVIEW**

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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CONTENTS

COVER: One of 80,000 fresh-water ponds used for fish farming in the Republic of Malagasy. Fish farming is mainly a family business in Malagasy. The simple fish farms add valuable protein to the Malagasy diet. The Government of Malagasy is encouraging fish farming and has also stocked lakes and rivers with species of fish that multiply rapidly. A fisheries expert of the Food and Agricultural Organization has suggested that fish from the farms could be preserved by smoking and drying and then transported to dry areas of Malagasy where protein foods are lacking.

Page

- 1 . . The Blue Crab and its Fishery in Chesapeake Bay--Part 2 - Types of Gear for Hard Crab Fishing, by
W. A. Van Engel

Page

TRENDS AND DEVELOPMENTS:	
Fishing Vessel and Gear Developments:	
11 . .	Equipment Note No. 13--Soviet Trawlers Observed in Gulf of Alaska, by A. T. Pruter
Alaska:	
12 . .	Soviet and Japanese Fishing off Alaska, June 1962
13 . .	Salmon Fishery Trends, June 1962
13 . .	Herring Fishery
13 . .	Tanner Crab Fishery
Alaska Fisheries Investigations:	
14 . .	Herring Investigations
14 . .	Salmon Fry Migrations
14 . .	Bristol Bay Red Salmon Studies
14 . .	King Crab Studies
14 . .	Pacific Herring May be Serious Predator of Pink Salmon Fry
Alaska Fisheries Exploration and Gear Re- search:	
15 . .	Trawler Chartered for King Crab Explorations
American Dietetic Association:	
15 . .	Annual Meeting
California:	
15 . .	Midwater Trawling for Salmon Fingerlings Continued
16 . .	Cans--Shipments for Fishery Products, January-May 1962
TRENDS AND DEVELOPMENTS (Contd.):	
Central Pacific Fisheries Investigations:	
16 . .	Tuna Studies in South Pacific Continued
Crab Meat:	
19 . .	New Crab-Picking Machine Invented
Federal Purchases of Fishery Products:	
19 . .	Department of Defense Purchases, January- June 1962
Fish Meal:	
20 . .	New Plant Proposed for Cape Charles, Va.
Fishy Odors and Flavors:	
20 . .	Progress on Studies to Date (June 1962)
Fish Farming:	
23 . .	Fish Crop from Flooded Rice Lands
Fish Protein Concentrate:	
24 . .	Bakery Products with Concentrate Sampled by Taste Panel
Florida:	
24 . .	New Fish Behavior Laboratory
Great Lakes:	
25 . .	Lake Trout Planted in Lake Michigan from Ferry
25 . .	Outlook Promising for Trawling in Lake Michigan
25 . .	Organoleptic Evaluation of Fresh-Water Herring

CONTENTS (CONTINUED)

Page	TRENDS AND DEVELOPMENTS (Contd.):	Page	TRENDS AND DEVELOPMENTS (Contd.):
	Great Lakes Fishery Investigations:		United States Fisheries:
26 . .	Western Lake Superior Fishery Survey Continued	43 . .	Commercial Fishery Landings, January-June 1962
26 . .	Lake Erie Fish Population Survey Continued	44 . .	Fish Sticks and Portions Production, April-June 1962
Gulf Exploratory Fishery Program:	Burrowing Behavior of Pink Shrimp Studied	U. S. Fishing Vessels:	
27 . .	Gulf Fishery Investigations:	45 . .	Documentations Issued and Cancelled, July 1962
28 . .	Better Shrimp Catches Forecast for 1962	46 . .	Documentations Issued and Cancelled, June 1962
29 . .	Shrimp Distribution Studies	U. S. Foreign Trade:	
Indian Fishing:	Law Enforcement Conference on Indian Fishing	46 . .	Imports of Canned Tuna in Brine Under Quota
29 . .	Industrial Products:	46 . .	Fishery Products Imports from U.S.S.R.
30 . .	U. S. Fish Meal and Solubles, Production and Imports, January-June 1962	46 . .	Insurance on United States Exports Extended to Longer-Term Policies
30 . .	U. S. Fish Meal, Oil, and Solubles:	Vessels:	
Production, June 1962	47 . .	French Fishery Research Vessel Visits Woods Hole, Mass.	
31 . .	Production, July 1962	Virginia:	
32 . .	Major Indicators for U. S. Supply, July 1962	48 . .	Outlook Promising for Croaker Populations in Chesapeake Bay System
Inventions:	32 . .	Washington:	
32 . .	Precooked Frozen "Lox and Onions"	49 . .	Chinook Salmon Tagging
Irradiation Preservation:	32 . .	49 . .	Salmon Planted in Klickitat River
32 . .	New United States Army Radiation Research Laboratory	49 . .	Salmon Spawning Channel at McNary Dam on the Columbia River
Maine Sardines:	33 . .	50 . .	Wholesale Prices, July 1962
33 . .	Canned Stocks, July 1, 1962	FOREIGN:	
Marketing:	33 . .	International:	
33 . .	Edible Fishery Products Marketing Prospects, Fall 1962	52 . .	International Pacific Halibut Commission: North Pacific Halibut Fishing in Area 3A Ended August 11, 1962
Massachusetts:	34 . .	Food and Agriculture Organization:	
34 . .	Marine Fisheries Promotion and Development Law Enacted	52 . .	Proposed Agenda for Fishing Gear Congress in 1963
Oceanography:	34 . .	Great Lakes Fishery Commission:	
34 . .	Williamsburg as Biological Research Ship for Indian Ocean Expedition	54 . .	Annual Meeting
36 . .	Williamsburg Renamed Anton Bruun and Converted to a Research Vessel	54 . .	Chemical Treatment of Lake Superior Streams Reduces Sea Lamprey Population
Oregon:	36 . .	55 . .	Contract-Fishermen Only to Fish Lake Trout in Lake Superior
36 . .	Albacore Tuna Studies in North Pacific	56 . .	Lake Trout Catches in Lake Superior Restricted to Quotas
36 . .	Chinook Salmon Trucked Around Cougar Dam	56 . .	International Association of Fish Meal Manufacturers:
37 . .	New Crab-Tagging Method	56 . .	Third Annual Conference
37 . .	Razor Clam Tagging Studies	57 . .	Organization for Economic Cooperation and Development:
Oysters:	37 . .	57 . .	Subsidies and Program for 1963 Discussed by Fisheries Committee
37 . .	Progress in Development of Chemical Control Method for Enemies	58 . .	UNESCO Intergovernmental Oceanographic Commission:
38 . .	Long Island Sound Observations on Spawning and Setting as of July 26	58 . .	Arabian Sea Plans of Indian Ocean Expedition Coordinated
39 . .	Maryland Observations on Spawning and Setting, July 1962	58 . .	Working Groups on Communications and Fixed Stations Meet in Paris
40 . .	Maryland Setting Observations, July 1962	59 . .	Group of Experts on Oceanographic Data Exchange Meets in Washington
40 . .	Weed "Steals" Oysters Planted in Oyster River	59 . .	International North Pacific Fisheries Commission:
Pacific Territories:	40 . .	59 . .	Scientific Committee Meets in Honolulu
40 . .	Expanded Fisheries Development Program Planned	59 . .	Whale Oil:
South Carolina:	40 . .	59 . .	Prices Decline
40 . .	Fisheries Biological Research Progress, April-June 1962	59 . .	Fish Meal
Sport Fishing:	42 . .	59 . .	World Production, May 1962
42 . .	Tropical Pacific Game Fish Schooling and Feeding Behavior Study	59 . .	International Whaling Commission:
Shrimp:	42 . .	59 . .	Fourteenth Annual Meeting
42 . .	United States Shrimp Supply Indicators, July 1962		
Tuna:	43 . .		
43 . .	Blackfin Tuna Studied to Determine Federal Specification Requirements		

Contents continued page III.

CONTENTS (CONTINUED)

Page	FOREIGN (Contd.): International (Contd.): European Economic Community: Canned Salmon Import Duty Rate Lowered Aden: United States Vessel to Fish Spiny Lobsters off Coast Angola: New Fish Processing Plant Opened Trawling Regulated Australia: Shrimp Farming Experiments Show Promise Southern West Australia Tuna Survey Results Tuna Fishery Trends, 1962 British Guiana: Shrimp Exports, 1961 Canada: Arctic Char Fishery New Products Being Developed from Under-utilized Fresh-Water Fish Species New Tax Applies to Shrimp Imported from the United States Purse Seiners in New Brunswick Can't Fish Within One Mile of Stationary Fishing Gear Sea-Bed Drifters Used to Study North Atlantic Ocean Currents Sea Lion Control Program in Coastal Waters of British Columbia Cook Islands: Joint Japanese-New Zealand Tuna Base Denmark: Filleting Association Seeks Closer Contact with Fishermen Fisheries Trends, Jan.-June 1962 Industrial Fish Landings were Heavy in June 1962 Pond Culture of Rainbow Trout Seaworthiness of Steel Cutters Under Study Second Danish-Built Fish-Freezing Vessel for U.S.S.R. Ecuador: Coastal Fishing Problems Being Studied Manta Tuna Fishery El Salvador: Fisheries Trends, Second Quarter 1962 Fiji Islands: Japanese Fisheries Agency Postpones Decision on Fiji Islands Tuna Base France: United States Quality Certification of Fresh or Frozen Scallops Accepted Greece: Freezer-Trawler Landings, January-June 1962 Greenland: Shrimp Industry Iceland: Fisheries Trends, January-July 1962 Exports of Fishery Products, January-May 1962 Icelandic Production of Processed Fishery Products and Byproducts, 1960-61 Fishery Landings by Principal Species, January-April 1962 Utilization of Fishery Landings, January-April 1962 Indonesia: Soviet Technicians Plan Construction of Oceanographic School	Page	FOREIGN (Contd.): Iran: Status of Fishing Industry Italy: Frozen Tuna Exported to Italy Directly from Japan Increase in Frozen Tuna Import Quota Requested Fishery Cooperatives Have Influential Role in Italian Fishing Industry Japan: Canned Tuna in Brine Sales to United States Exports to U. S. of Canned Tuna in Brine, 1961 Canners Consider Increase of Canned White Meat Tuna Export Prices Shizuoka Packers Can Skipjack Tuna for U. S. Skipjack Tuna Ex-Vessel Prices Make Canning Unprofitable Albacore and Yellowfin Tuna Prices for Exports to United States Frozen Tuna Approved for Export to U. S. Tuna and Swordfish Exports, Calendar Years 1956-60 Ex-Vessel Tuna Prices in Tokyo Frozen Tuna Ex-Vessel Prices at Tokyo, August 10 Skipjack Tuna Landings at Yaizu Yaizu Fishery Landings, January-June 1962 Tuna Fishing Conditions off Home Island, Early July 1962 Tuna Quotas Increased for Motherships and Certain Overseas Bases Fisheries Agency Requests Vessels to Submit Yellowfin Tuna Catch Data Research Vessel to Survey Eastern Pacific Ocean Tuna Resources Research Vessel Investigates Albacore Schools in North Pacific Vessels Operating in South Atlantic Tuna Fishery, July 1962 Research Vessel to Explore for Tuna in South Atlantic Ocean New Albacore Tuna Areas in Atlantic Discovered Additional Tuna Vessel Tonnage Changes Sought in Regulations on Portable-Vessel-Carrying Tuna Mothership-Type Operations Tuna Fishing Vessel Tests Power Block Tuna Company to be Established by Cooperative National Cooperative Schedules Meeting to Study Use of Its Tuna Vessels Long-Line Vessels Reach Salmon Catch Goal South of 45° N. Latitude Salmon Mothership Fleets in North Pacific Reach Catch Quota Frozen Halibut Export Prices Steady Bering Sea Halibut Landings King Crab Operations in Bristol Bay Government Issues Fall King Crab Fishing Licenses and Regulations Landings of Fishery Products in 1961 Salmon Industry Urges End of Abstention Principle Socialist Party Opposes Extension of Tripartite North Pacific Fisheries Convention Fishing Firms Plan Trawl Fishing in Northwest Atlantic
------	---	------	---

CONTENTS (CONTINUED)

Page	FOREIGN (Contd.):	Page	FOREIGN (Contd.):
	Japan (Contd.):		Spain:
92 .	Fisheries Agency Authorizes Trawling in Northwest Atlantic Ocean	102 .	Vigo Fisheries Trends, Second Quarter 1962
92 .	Guidance and Concentration of Fish Schools to be Studied	Sweden:	
93 .	New Marine Research Institute Established Republic of Korea:	104 .	Fishing Gear Attachment for Simultaneous Trolling at Different Depths
93 .	Firm to Purchase Tuna Vessels	Taiwan:	
93 .	Six Tuna Vessels to be Built in Japan	104 .	Fishery Landings Up in 1962
94 .	Fishery Cooperatives Law Enacted Malagasy Republic:	U.S.S.R.:	
94 .	Japanese and Chinese Aid in Developing Tuna Fishery	105 .	Fishing Fleet on Georges Bank, June 1962
95 .	Fisheries Trends	105 .	Fishing in Gulf of Alaska, June-July 1962
	Malaya:	United Kingdom:	
96 .	Japanese-Malayan Tuna Base Concentrating on Frozen Tuna Exports	105 .	British Fisheries Trends, 1961
96 .	Frozen Tuna Transshipments to U. S. from Penang and Singapore	108 .	British Fishermen Need New Fishing Grounds
97 .	Tuna Fishermen Urged to Bring Catches to Penang	109 .	British Suggest Using Helicopter for Ocean Trawling
	New Caledonia:	109 .	Fishery Loans Interest Rates Revised
97 .	Tuna Catch Quota for Japanese-French Fishing Base	109 .	New Subsidy Rates
	Norway:	Viet-Nam:	
97 .	Mackerel Shark Fishery Off United States Waters	111 .	Two New Trawlers Added to Fishing Fleet
97 .	Foreign Minister Presents Declaration on Membership in EEC	Yugoslavia:	
98 .	Only Four Fleets to Participate in 1962/63 Antarctic Whaling	111 .	Canned Fish Pack Up in 1961
	Pakistan:	FEDERAL ACTIONS:	
99 .	United States Firms Invited to Aid Government in Developing Fisheries	Department of the Interior:	
	Panama:	Fish and Wildlife Service:	
100 .	Vessel Chartered for Spiny Lobster Explorations	Bureau of Commercial Fisheries:	
	Peru:	112 .	Revision of Fisheries Loan Fund Procedures
100 .	Fisheries Trends, Second Quarter 1962	114 .	Eighty-Seventh Congress (Second Session)
	South Africa Republic:	FISHERY INDICATORS:	
101 .	Tuna Fishing Development Opportunities	120 .	Chart 1 - Fishery Landings for Selected States
101 .	Pilchard-Maasbunker Fishery, January-March 1962	121 .	Chart 2 - Landings for Selected Fisheries
	South-West Africa:	122 .	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
102 .	Fishery Trends for 1961	123 .	Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
		123 .	Chart 5 - Fish Meal and Oil Production - U. S. and Alaska
		124 .	Chart 6 - Canned Packs of Selected Fishery Products
		125 .	Chart 7 - U. S. Fishery Products Imports
			RECENT FISHERY PUBLICATIONS:
		126 .	Fish and Wildlife Service Publications
		129 .	Miscellaneous Publications



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THE BLUE CRAB AND ITS FISHERY IN CHESAPEAKE BAY^{1/}

Part 2 - Types of Gear for Hard Crab Fishing^{2/}

By W. A. Van Engel*

ABSTRACT

During the 90-year history of the Chesapeake Bay blue crab fishery, many types of fishing devices were tried, but only pots, trotlines, and dredges proved suitable, and they emerged as the primary types of gear for catching hard crabs. In the early years of the fishery, trotlines with their various modifications were used principally for catching hard crabs in the summer. The Chesapeake Bay crab pot, patented in 1938 and modified only slightly since, gradually replaced the trotline. Pots now account for two-thirds of the Virginia hard crab catch and more than half of the Maryland catch. The dredge, first used about 1900 and relatively unchanged with time, is still the primary winter gear.

INTRODUCTION

The gradual increase in importance of the 90-year-old blue crab industry to the economy of the Chesapeake Bay region has been due chiefly to development of the hard crab fishery. It now ranks second or third among Virginia and Maryland's fisheries, exceeded in quantity only by menhaden and in value by oysters and occasionally by menhaden. On the national scale, the magnitude of the industry is equally impressive, for the total Chesapeake Bay hard crab catch is about equal to the total blue crab catch of all the other Atlantic and Gulf Coast states.

Prior to 1900 the Chesapeake Bay blue crab industry developed slowly and fishing for crabs remained a casual occupation. Although there has been a coast-wide consumer interest in the blue crab since colonial times, especially in the soft-shell crab, limited transportation and refrigeration facilities hindered the early expansion of the industry. The first out-of-state shipment of Chesapeake Bay soft crabs left Crisfield, Md., for Philadelphia by train in 1873. In 1878, a large summer trotline fishery was started near Hampton, Va., to supply hard crabs to James McMenamin and Company, the first to produce cooked crab meat in hermetically-sealed cans. Fresh-cooked crab meat in iced, unsealed cans was not made available until 1883. During those early years and un-

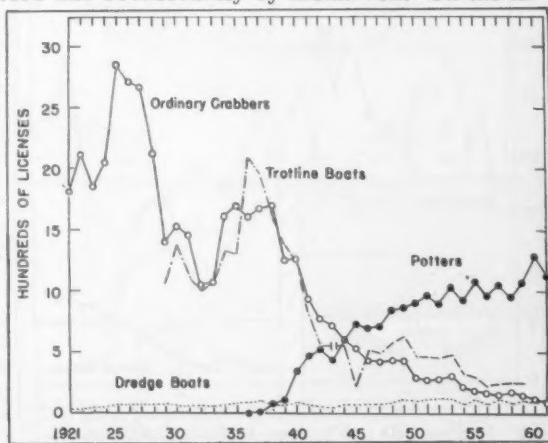


Fig. 1 - Virginia hard crab licenses, 1921-1961. Numbers of ordinary crabbers, potters and dredge boats are from unpublished license records of the Virginia Commission of Fisheries. Combined hand-dip and patent-dip trotline boats are from records of U. S. Bureau of Fisheries and U. S. Fish and Wildlife Service; no data available for 1943. Over 90 percent of the "ordinary crabbers" licenses are for hand-dip trotlines.

^{1/}Contributions from the Virginia Institute of Marine Science, No. 121.

^{2/}Soft and peeler crab fishing gears will be described in a later publication.

*Senior Marine Scientist, Virginia Institute of Marine Science, Gloucester Point.

til 1900, average annual landings in Virginia and Maryland were less than 10 million pounds and were valued at less than \$350,000. Sixty percent of the weight but only one-fourth of the value was derived from hard crabs. The remainder was attributed to soft and peeler crabs^{3/} (Rathburn 1887, Roberts 1905, Churchill 1919, U. S. Bureau of Fisheries 1922).

In contrast, landings during a recent 15-year period, 1946-1960, averaged about 60 million pounds and valued at more than \$3.5 million. Over 90 percent of the catch and about 80 percent of the value was derived from hard crabs (U. S. Fish and Wildlife Service 1942-1961, 1961).

From 1929 to 1932^{4/} more than 85 percent of the total Atlantic and Gulf Coast catch of blue crabs came from Chesapeake Bay. Average Chesapeake landings were about 60 percent from 1933 to 1953, and since 1953 have been about 47 percent of the total (U. S. Bureau of Fisheries 1922-1941; U. S. Fish and Wildlife Service 1942-1961, 1961).

Almost the entire hard crab catch of the Bay is now marketed as fresh-cooked crab meat in iced, unsealed cans. In 1959, 7.5 million pounds of meat was produced, half from Virginia and half from Maryland. The extent of distribution has been somewhat limited by extreme fluctuations in the basic supply, the perishableness of the product, and the relatively high costs of production, transportation, and promotion (Quittmeyer 1950, 1957; Van Engel 1954, 1958). Some of the meat is processed as frozen deviled crabs and crab cakes, and canned crab soups. A relatively small number of large, selected male crabs, called "jimmies" or "channelers," are shipped alive direct to large cities to be served at seafood bars as steamed hard crabs.

At the base of the production pyramid is a force of about 1,800 watermen in Virginia and 3,300 in Maryland. Since their catch is limited by the basic supply and by restrictions imposed by legislation and market conditions, only by selecting the most efficient types of gear can the watermen maintain a reasonable income. While many types of gear have been used to catch crabs in the Chesapeake Bay in the last 90 years, only a few have proved economically practical.

The bulk of the hard crab catch has been made by a few types of widely different design: crab pots and trotlines in summer and dredges in winter. Less than one-fiftieth has come from dip nets, crab pounds, hand scrapes, haul seines, and hand lines, and incidental catches by fish pounds, gill nets, otter trawls, oyster tongs, and oyster dredges. Modifications have made existing gear more efficient, resulting in more effective fishing time per unit of gear. A review of the types of Maryland crab fishing gear is given by Cargo (1954).

Continuous records of the types of hard crab gear in Virginia are available since 1921 (fig. 1) and in Maryland since 1916 (fig. 2)--(Virginia Commission of Fisheries, unpublished license records; Maryland, Department of Conservation 1924-1941, Department of Tidewater Fisheries 1942, Board of Natural Resources 1941-1959). Reports of the U. S. Bureau of Fisheries (1922-1941) and the U. S. Fish and Wildlife Service (1942-1961) show similar trends in types of gear, but continuous records are not available for years prior to 1929.

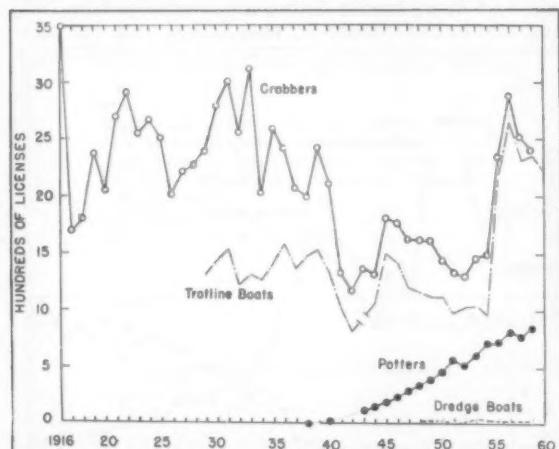


Fig. 2 - Maryland hard crab licenses, 1916-1960. Numbers of crabbers, potters and dredge boats are from the Maryland Conservation Department, Department of Tidewater Fisheries and Board of Natural Resources. Hand-dip trotline boats are from records of U. S. Bureau of Fisheries and U. S. Fish and Wildlife Service; no data available for 1943. Hand-dip trotline licenses account for about one-half the "crabbers" licenses prior to 1938.

TRENDS IN GEAR

The hand-dip trotline was favored for many years as a summer gear. The exact number used will probably never be known. Until 1937 hand-dip trotlines were exempted from tax-

^{3/}Soft and peeler crab fishing gears will be described in a later publication.

^{4/}Comparative data are not available for earlier years.

tion in Virginia or included in a general "ordinary crabbers" license along with dip nets and peeler-crab scrapes (fig. 1). Since 1937 peeler-crab scrapes have been separately licensed, and trotline licenses have numbered probably more than 95 percent of the "ordinary" licenses. Patent-dip trotlines, introduced about 1920, have never been widely used and have accounted for a relatively small percentage of the catch. Combined estimates of hand-dip and patent-dip trotline boats (U. S. Bureau of Fisheries 1922-1941; U. S. Fish and Wildlife Service 1942-1961) are in good agreement with the numbers of "ordinary crabbers" licenses in Virginia since 1929 (fig. 1). It is probable that before 1929 over 90 percent of the "ordinary" licenses were hand-dip trotlines.

During the economic depression of the early 1930's, many Virginia watermen replaced their trotlines with dip nets, for which no license and little expense were required, and caught peeler crabs instead of hard crabs. A few years later, during a temporary return to trotlines, the Chesapeake Bay crab pot was introduced. The high efficiency of the pot has encouraged many watermen to abandon trotlines for them. Dredges have been the only gear used in Virginia in the winter fishery since its inception about 1900.

Similar trends have occurred in Maryland although the exact numbers of gear types used have not been reported. Since 1916 a general "crabbers license" has permitted the use of a trotline, peeler-crab scrape, dip net, push net, crab haul seine, or crab pound net (fig. 2). Between 1929 and 1938 approximately one-half of the "crabbers" licenses were for the use of hand-dip trotlines (U.S. Bureau of Fisheries 1922-1941); this relationship probably existed prior to 1929. The decline in number since 1938 is the result of the gradual replacement of trotlines with pots. The precipitous rise in 1955 and 1956 resulted from a new law requiring licenses for all trotlines over 100 yards in length. This was enacted to tax increased numbers of casual crabbers, and the figures are probably indicative of previously existing but unreported effort. Patent-dip trotlines have never been used in Maryland. Dredges were first permitted in Maryland in 1947 and are used only in the bays on the ocean side of the eastern shore.

CRAB POT

The first crab pot used in Chesapeake Bay was a small, baited poultry-wire trap, 36 x 30 x 12 inches, patented in 1928 by B. F. Lewis of Harryhogan, Va. (Virginia Commission of Fisheries, unpublished minutes; Wharton 1956). Lewis' early model pot was not widely used because it allowed too many crabs to escape. His modified gear, which was introduced in 1936 and patented in 1938 (fig. 3), is essentially the design used today. The principal feature of this patent is the separation of the main body of the pot into two chambers, a lower bait chamber which contains a bait holder and passageways from the outside, and a trap chamber lying over the bait chamber. Hard crabs enter the bait chamber through entrance funnels located at the lower edges of the pot and then rise to pass into the trap chamber through a slit in the partition. Crabs are removed by spreading an opening in one seam at the top and shaking the crabs from the pot. The seam is closed by lapping over the adjacent edges and locking them in place with a wire hook.

Usually pots are cubical in shape, 2 feet on each side, and made of 1 to 1½-inch hexagonal mesh, 18 gauge poultry wire, galvanized

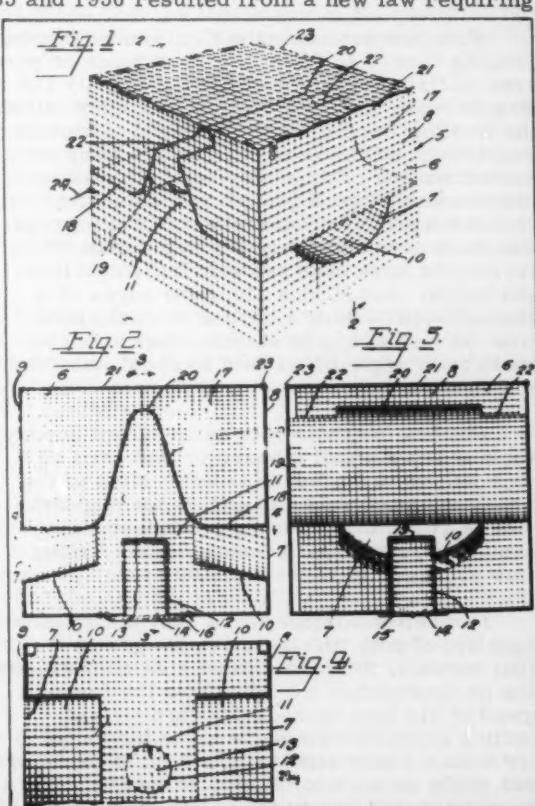


Fig. 3 - Drawings accompanying B. F. Lewis' crab pot (trap) patent, filed September 2, 1937. Fig. 1, External view; Fig. 2, Vertical section through entrance funnels, bait box and partition; Fig. 3, Vertical section, at right angle to Fig. 2, through bait box and partition; Fig. 4, Part of horizontal section top of funnels.

after weaving (fig. 4). Bait cups are made of 1-inch mesh wire or double thickness of $1\frac{1}{2}$ -inch wire. Nine pots can be cut from a roll of wire 150 feet long and 2 feet wide.

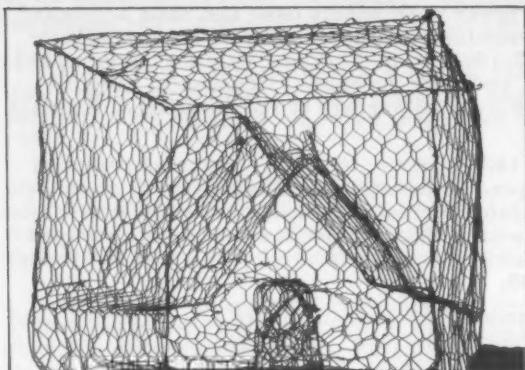


Fig. 4 - Chesapeake Bay crab pot is 24 x 24 x 20 inches, made of double-galvanized, 18-gauge, hexagonal-mesh wire.

James rivers, where there are strong bottom currents, pots are made only 20 inches high.

Pots are set along the flat, sandy or muddy edges of a river or Bay channels in depths ranging from 6 to 60 feet in continuous or parallel series, the number depending on the success of fishing in the locality but usually 100 or more feet apart. In 1928 as many as 30 to 40 pots were tied on a trotline, each pot attached to the line by a 4-foot rope. The ends of the trotline were marked by buoys. Later to avoid frequent thefts of pots, buoys were removed and the crabber depended on visible landmarks and good grappling technique to recover his line. That method of setting pots was soon abandoned, and for more than 25 years pots have been set with individual lines and buoys. Sometimes along the edges of a channel approaching a harbor or dock, pots must be tied singly to stakes, otherwise they could be dragged or washed to shoal water by boat traffic.

Potters lift their pots daily except Sunday, working from small inboard or outboard motor boats up to 40 feet in length. Most of the men leave their docks in early morning darkness to reach the crabbing grounds at day-break and return about noon. Actual fishing time averages $2\frac{1}{2}$ hours per 100 pots.

For better control of his boat while fishing a set of pots, the potter runs against the tidal current. With an almost continuous motion he approaches a buoy, slows the forward speed of his boat by reducing throttle and shifting gears to reverse, snares the buoy line with a short-handled hook, shifts to neutral, pulls on the buoy line to raise the pot to the surface and into his boat (fig. 5), shifts to forward gear, increases throttle and steers toward the next pot. Then he begins to empty the pot and re-bait it with menhaden, salted fish heads, or any kind or part of oily trash fish. Just before he reaches the next pot the previous one is tossed overboard.

Only minor improvements have been made to the basic design of Lewis' patent since 1938. Details of a design popular in the late 1940's are given by Andrews (1947). Frames of iron rod were lashed to the sides to increase the rigidity of the pot, but have not been used since wire manufacturers began using heavy gauge wire in the selvage.

Since all pots are handmade, their construction can be varied to suit local conditions, individual preference and budget. Continued use of pots has demonstrated a need to increase their stability. All watermen stabilize their pots with a square frame of $\frac{1}{2}$ to $\frac{3}{4}$ -inch iron rod tied to the base, or galvanized pipe, bricks or cement inserted in the bottom corners. In Tagier Sound and in the York and



Fig. 5 - When stock size is large, catch may average 200 adult crabs per pot.

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In early summer in some waters, algal growth may cover the mesh. Circulation of water through the pot is retarded, the pot is more easily tumbled by strong currents, and the escape of bait odors is restricted. For these as well as other reasons, the efficiency of the pot is effectively lowered. Sometimes pots are removed to land and dried for several days, but usually they are so fouled by the middle of June that they are discarded.

During the 8 months potting season, from April through November, the loss of pots from all sources is so great as to require one or more replacements for each pot initially set out. Large losses occur in storms, for strong bottom currents or turbulence may tumble a pot into deeper water or roll it a few yards until the buoy line becomes wrapped around it. In either event the buoy is pulled beneath the surface and out of sight of the fishermen. Sometimes pots may be recovered by dragging bars of ganged hooks.

Careful handling of pots is required to minimize cracking the protective zinc coating. Once the underlying iron core is exposed, corrosion is rapid. At best, pots withstand daily wear and corrosion about 16 weeks. Recent studies suggest that corrosive destruction may be prevented if a sacrificial anode of zinc is secured to the galvanized netting (Buck and Van Engel 1960). At the end of the crabbing season, usable pots are sometimes dipped in hot tar to prevent further corrosion until the next season.

The crab pot has become especially popular because it is highly efficient, simply constructed, easily handled, and requires relatively little time to gather the catch. An estimated 100,000 pots were used in 1960 in Virginia; about three-fourths that many in Maryland. The pot has almost completely replaced the hand-dip trotline in Virginia and now accounts for two-thirds of the annual catch of hard crabs.

B. F. Lewis' early model was called a "trap," a name also applied to the crab pound net. Separate names and license taxes for pots and traps were not applied until about 1938. The number of pot licenses has steadily increased in Virginia (fig. 1), and the number of pots allowed each man has changed. An unlimited number could be used before 1940, 35 per man until 1944, 50 per man until 1956, and an unlimited number since July 1956. Minimum mesh size was 1 inch until 1941. From 1941 to 1944, 1-inch mesh was allowed in Chesapeake and Mobjack bays, but $1\frac{1}{2}$ -inch mesh was required in all other waters. It has been $1\frac{1}{2}$ inches in all waters of the Commonwealth since 1944.

Similar events occurred in Maryland. The pot was introduced in 1939 and then outlawed from 1941 to 1943. It is now permitted in some waters of that state (Cronin 1950). The allowance per man was 35 from 1943 to 1948 and has been 50 since 1948. Minimum mesh size is 1 inch. It is one of the most important types of crab gear in Maryland, where landings by pots represent over 55 percent of the total annual catch.

TROTLINE

The hand-dip trotline is a baited, hookless line anchored on the bottom in moderate to deep water, and is used to catch hard crabs when they are actively feeding, primarily from April through November. Lengths of $\frac{1}{8}$ to $\frac{3}{16}$ -inch cotton, sisal, or hemp rope are spliced together to form lines 100 yards to 1 mile in length, depending on the locality of the set and the "crab-biting-rate." When large numbers of crabs are being caught, lines may be shorter so that the crabber may lift his set before all the bait is eaten. The longest lines are used wherever bottom currents are strong, to insure a constant, effective number of baits lying on the bottom. Untarred lines are usually used because they do not give off odors offensive to crabs.

Trotlines have been used continually since commercial crabbing began in the 1870's. Formerly they were rigged with grapnel-type anchors tied to each end, and with a buoy line attached 30 or more feet from each grapnel (fig. 6A). With this system of rigging, while the trotline was lifted to the surface by pulling in the buoy line, it was necessary that the boat remain stationary over the end of the set, to avoid dragging the anchor and thus changing the direction of the set or getting the line fouled in the propeller.

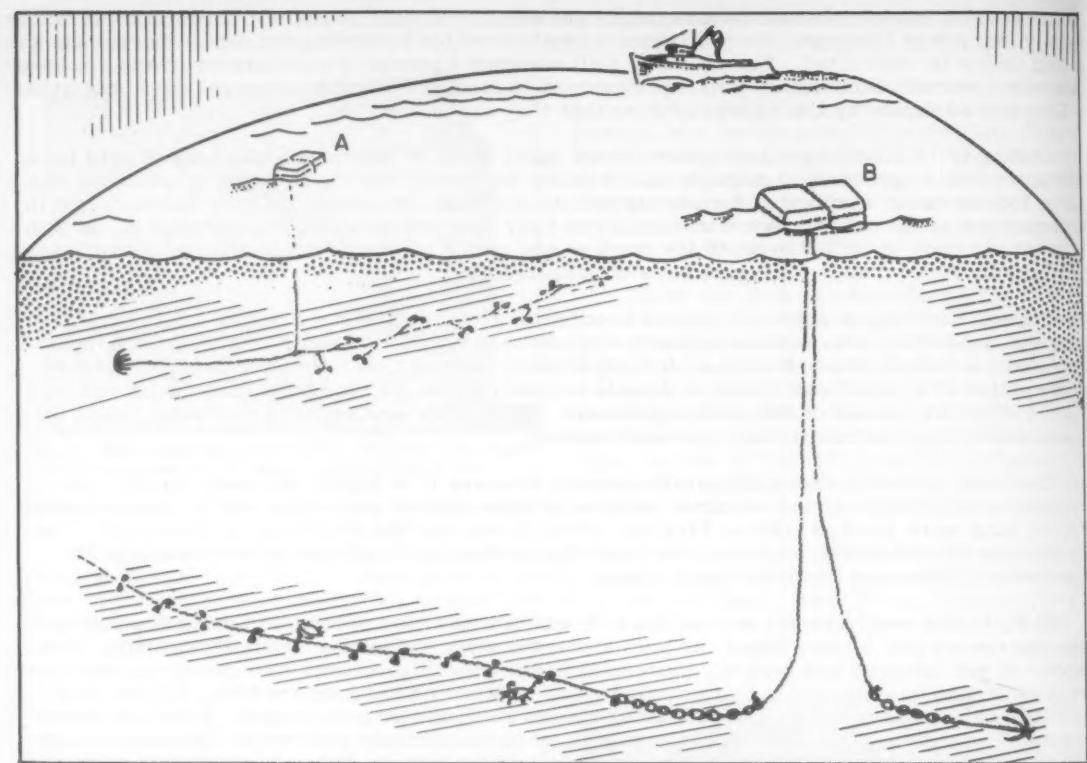


Fig. 6 - A. Former arrangement of buoys and line on hand-dip trotline. B. Present rigging of hand-dip trotline.

These problems are now avoided simply by dropping separate lines from the buoy to the grapnel and from the buoy to the trotline (fig. 6B; Andrews 1948). The ends of the buoy line and trotline are joined by a short length of heavy chain to keep the trotline on the bottom. This arrangement permits the crabber to approach the buoy, lift the trotline to the surface, place it over the spool, and begin fishing with the continuous forward motion of the boat.

Fresh beef tripe is preferred as bait, although salted tripe and eels, hog jowls and ears, and small, tough fish such as the hogchoker are sometimes used. About 200 pounds of tripe may be used each week during October and November on a 600-yard line. More bait is used in summer when crabs are more active. From 60 to 80 pounds of tripe are used on the first full baiting of the line.

When the trotline was first extensively used in 1878, bait was tied to the ends of 6- to 24-inch lateral lines, called snoods, spaced about 2 feet apart (fig. 6A). The size of the catch was partly dependent on how many times a crabber could run the same line in one day. In the earliest years of the fishery, the crabber pulled his boat forward by lifting and tugging, hand-over-hand, on the trotline. It was most convenient, but not comfortable for long periods of time, for him to lie prone on the bow of his boat while crabbing. A short-handled dip net was kept handy to scoop up crabs as they came to the surface clinging to the baited line. "Hand" trotlining was easiest "running" with the tide or with the wind.

Although most men used the "hand" trotline between 1900 and 1925, a few used sail, or motor power derived from either a 2-cycle or 4-cycle, 1- or 2-cylindered marine engine. Most engines were direct-drive, and a clutch was optional equipment. At first, motor power was used primarily for transporting groups of 10 or more "hand" trotline crabbers

to and from the crabbing grounds. Men who used their direct-drive engines in working a line were forced to work against the tide, or to obtain slower speeds by means of a drag. This required a two-man crew, one to watch the trotline and scoop up crabs, the other to run the engine.

To take advantage of the greater speed of a motor boat, the trotline was no longer lifted by hand, but allowed to pass over a roller or spool extending outboard from the side of the boat (fig. 7). This forced abandonment of lateral lines, for they easily became entangled on the spool. Thereafter bait was secured either in a slip-knot or simply tucked between strands of the main line.

In the late 1920's automobile engines were converted for boat use. Since then their low cost has more than offset their inefficiency compared with marine engines of the same horsepower, and they have become almost standard as the power supply of present day crab boats (Chapelle 1955).

Trotlines usually are set parallel to shore to be fished with the tide up- or downriver. If fished during slack tide, it may be set in any direction, usually perpendicular to shore. To fish his line, the crabber approaches the buoy, picks up the line with a short-handled hook and places it on the spool which projects about a foot from the side of the boat. As the boat moves along the line, baits are raised to the surface and crabs clinging to the bait are scooped up by a dip net. Crabs drop off as the line breaks the surface of the water and crabbers must be quick with the dip net. Since crabs cling to a cotton mesh bag, the most effective dip net has a wire mesh bag.

Trotlines usually are fished from daybreak to late morning, and sometimes, though infrequently, fished again in the cooler evening hours. At the end of a day's fishing, baits are checked and renewed if necessary, and the line coiled in a barrel and well-sprinkled with salt to protect bait and line against rotting.

The trotline has been extensively used in localities where many undersized crabs are present, as in the upper-Bay waters of Maryland, for it permits easy culling of the catch.

Until the early 1940's it consistently accounted for two-thirds of the entire Bay catch of hard crabs, but in recent years, since watermen abandoned trotlines in favor of pots, less than 10 percent of the Virginia hard crab catch and about 43 percent of the Maryland catch has been obtained with trotlines.

PATENT-DIP TROTLINE

The patent-dip trotline differs from the hand-dip trotline only in the method by which crabs are dipped out of the water (fig. 8). The patent-dip consists of a rectangular or cylindrical cage about 3 feet square made of a framework of iron strips and rods. To the bottom is attached a cylindrical net of heavy twine, about 10 feet long, which is closed at the end with a piece of light twine. The iron cage is attached by heavy iron straps to a boom or spar which may be hoisted up against the boat mast or lowered to a horizontal posi-



Fig. 7 - The hand-dip trotline.

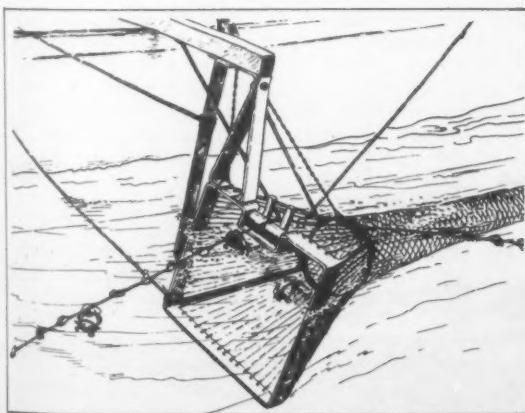


Fig. 8 - The patent dip is attached to a boom which may be hoisted up against the mast or lowered, as shown here, to a horizontal position when fishing the line, with the top of the dip at the surface of the water.

tion. When the boom is lowered, the cage lies in the water with the upper edge at the surface. On this upper rim of the cage are two upright pegs about 5 inches apart, and a roller. When the crabber starts his run of the trotline, he places the line over the roller between the upright pegs. Then as the boat cruises along the set, the line is lifted off the river bottom and over the roller. As they reach the surface, crabs drop into the iron cage and are caught in the trailing net. When the net is full, the boom is hoisted to an upright position, the tie-string at the end of the net is loosened, and the crabs are dumped into a barrel or into the bottom of the boat.

The patent-dip rig permits the waterman to run more sets than could be made with a hand-dip trotline, for culling of illegal crabs can be made any time after the catch has been made. Watermen claim that in early spring and late fall trotlines yield higher catches than pots. Crabs are less sensitive to bait odors when the water is cool. Trotline baits 2 to 4 feet apart are more quickly located than bait in pots spaced at intervals of 100 or more feet.

Since 1920, when patent-dip trotlines were first licensed, the number of licenses issued yearly in Virginia has been small and variable. Licenses are not considered a reliable index of the number of gear actually used, for crab pots or patent-dips may be used by holders of either license. Patent-dips have never been used in Maryland waters.

DREDGE BOAT

The dredge boat (fig. 9) varies from less than 32 to over 60 feet in length, 5 net tons or more, and carries a captain and a crew of two or three. On larger boats two dredges are towed simultaneously from opposite sides of the boat, the chain from each dredge passing

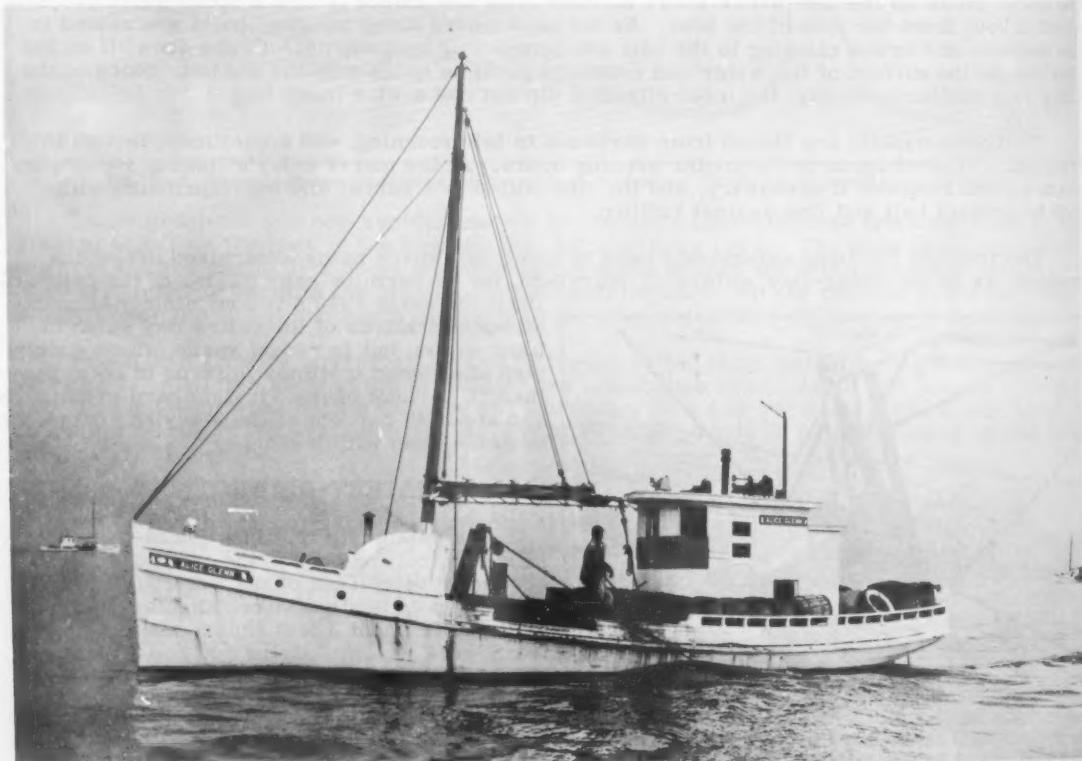


Fig. 9 - Dredge boats, often Diesel-propelled, are from 32 to 60 feet in length, five net tons or more, and tow two dredges simultaneously from opposite sides.

over a roller on the boat's rail, around a center post and then below deck to a windlass operated from the pilothouse (fig. 10). Smaller boats often drag a single power-drawn dredge over the stern.

The heavy metal dredge consists of a rectangular iron frame, bearing a 6-foot, toothed drag bar on its lower edge and carrying a mesh bag made up of rings and cotton twine. The bag will hold between 3 and 4 bushels of crabs. The iron teeth, welded on the drag bar, are about 4 inches long and about $1\frac{1}{2}$ inches apart. A metal bridle attached to the dredge frame bears an eye to which the hauling chain is fastened. The length of a dredge, from the drag bar to the eye of the frame, varies with the amount of space available when the dredge is hauled on deck to be emptied, but should be about 6 inches less than the distance from the top of the dredge post to the roller.

Dredging is almost the only means of obtaining crabs from December through March, when the "crab-biting-rate" is almost zero and movements of crabs are minimal. Dredging is limited by law to the lower Bay and to the small bays on the ocean side of the eastern shore. Concentrations of crabs in the lower part of the Chesapeake during the winter occur as a result of the fall migrations of adult female crabs from the rivers and upper Bay following mating (Van Engel 1958). The best catches are made on the edges of broad banks adjacent to deep channels of the Bay, over "grassy,"⁵ muddy-sand bottoms, in 25- to 75-foot depths. During an average fishing day from 65 to 100 ten-minute dredge hauls can be made, lifting the dredges alternately.

The dredge catch is highest in early December and becomes progressively smaller as the season advances. Approximately 85 percent of the crabs caught are adult females, and the remaining 15 percent are males and immature crabs of both sexes. About half the total catch is landed on the west shore of the Bay between the Piankatank River and the James River. The other half is landed on the Eastern Shore, principally for sale in Maryland markets.

Since the winter dredge fishery began in Virginia about 1900, there have been few changes in methods of dredging or in the gear. Dredges have been similar to those now in use, but varying from 4 to 6 feet in width. Before 1920, gasoline and semi-Diesel engines developing 20 to 60 hp. were in common use. Since then there has been gradual replacement by engines of higher horsepower. Dredge-boat captains unanimously believe that this change has increased daily catches, by shortening the running time from port to fishing grounds and thus permitting more time for dredging, rather than by increasing the average catch per dredge haul.

The "Geraldine," an 11-net-ton Gloucester County vessel, may be considered representative of the majority of vessels now used in the fishery. Built in 1928, she was first equipped with a 24 hp. Lathrop, a marine, gasoline engine with a straight drive and no clutch. Other dredgers were using 24 to 35 hp. Palmer, marine, gas engines, and a few of the larger vessels had 45 to 65 hp. Fairbanks-Morse, marine, semi-Diesels, all straight drive with clutch. A 50 hp. 20th Century, marine, gas engine was installed in the "Geraldine" in 1932. This in turn was replaced in 1944 with a 144 hp. Chrysler Royal gas engine converted for marine use and had a 3:1 reduction gear. A 165-hp. Gray marine Diesel with a 2:1 reduction gear was installed in 1946; this Diesel has had three major overhauls in the last 16 years and is still in use.

⁵Beds of colonial hydroids, *Thuiaria argentea*.



Fig. 10 - The crab dredge.

The number of boats dredging hard crabs in the Bay in the earliest years of the fishery is unknown, for they were often reported with boats dredging in ocean waters and sail boats scraping peeler crabs in summer. Since 1921, the number has increased from 50 to about 110 vessels (fig. 1).

On the ocean side of the eastern shore of Accomack and Northampton counties of Virginia, $3\frac{1}{2}$ to 6 foot dredges were once used. Since 1937 dredges have been limited to 3 feet in width and must be hand-drawn, not power-lifted, into the boat.

Since its inception, the Virginia dredge fishery has landed from 10 to 30 percent of the total Virginia hard crab catch and at present accounts for about 20 percent of the landings. About 4 percent of the winter catch comes from the ocean-side bays.

Dredging was first permitted in Maryland in the winter of 1947-1948. Three-foot wide, hand-drawn dredges are now used in Chincoteague Bay, Sinepuxent Bay, Isle of Wight Bay, and Assawoman Bay and their tributaries in Worcester County, Md. (fig. 2). The Maryland winter catch is about one-third of the Virginia oceanside catch.

When trotline and pot catches in late November or early April are very low and insufficient numbers of crabs are being landed or shipped in to meet market demands, the Virginia Commission of Fisheries may permit crab dredging to begin as early as November 16 or last until April 16.

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TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 13-- SOVIET TRAWLERS OBSERVED IN GULF OF ALASKA:

On May 5, 1962, two Soviet trawlers were observed by the U. S. Bureau of Commercial Fisheries research vessel John N. Cobb on the Albatross Gully grounds (vicinity of $57^{\circ}59'N$. latitude, $149^{\circ}51'W$. longitude) in the Gulf of Alaska (fig. 1). These grounds are heavy producers of halibut for the United States and Canadian long-line fleets. They also yielded up to ten metric tons of Pacific ocean perch (*Sebastodes alutus*) per hour of Soviet exploratory trawling in 1960 (Moiseev and Paraketsov 1961). The Albatross Gully grounds, along with grounds south of Unimak Island and southwest of the Shumagin Islands, are considered likely areas for expansion of the Soviet's Pacific ocean perch trawl fishery.



Fig. 1 - One of two similar Soviet trawlers encountered May 5, 1962, by M/V John N. Cobb in the Gulf of Alaska.

The Soviet vessels observed from the John N. Cobb were identical side trawlers with estimated lengths of 160 to 170 feet. They bore identification numbers SRT-R-9162 and SRT-R-9165. Twenty-two crew members (including one woman) were observed on deck of one vessel when first contact was made.

Otter boards used by the Soviet trawlers were oval-shaped and were used to spread a large trawl net of synthetic construction



Fig. 2 - Soviet trawler hauling net containing an estimated 15,000 pounds of Pacific ocean perch.

which appeared to be rigged to fish just above the bottom (fig. 2). The net may have been a bottom herring trawl of the type reported adopted for Pacific ocean perch fishing in the Gulf of Alaska (Lubimova 1961). An estimated 80 to 100 metal floats were observed attached to the headrope of the net and there were about 12 droppers, each about one-fathom long, spaced along the footrope of the net. One "sash weight" estimated to weigh about 40 pounds was attached to the end of each dropper. When the sash weights contact the bottom, the reduced weight on the footrope apparently allows the net to raise enough to clear small obstructions. The wings and intermediate section of the net appeared to be of double mesh construction. No gilled fish were seen in two catches observed at close range.

A tracing of the net used by one of the Soviet trawlers was obtained on the John N. Cobb's white-line echo-sounder (fig. 3). The tracing clearly shows the trawl warps and outline of the trawl while it was fishing at a

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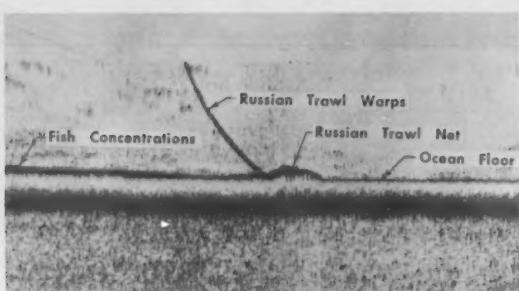


Fig. 3 - Echo tracing obtained from M/V John N. Cobb of Soviet trawl warps and net at depth of 120 fathoms.

depth of 120 fathoms. The proportion of the vertical scale on the echo-sounder tracing occupied by the net indicates the net's head-rope was from 25 to 30 feet above the ocean bottom.

An estimated 15,000 pounds of Pacific ocean perch were caught in the haul from which the echo tracing was obtained. A subsequent haul, when the net apparently snagged on a bottom obstruction, yielded an estimated 3,000 pounds of Pacific ocean perch. Both catches were dumped directly into the vessel's hold, which prevented accurate observation of the species caught. However, no species other than Pacific ocean perch could be seen in the net while it was alongside the vessel or when the catches were lifted aboard.

A great deal of echo-sounding was done by the Soviet trawlers prior to actual setting of their nets. This apparently was necessary to determine the type of bottom and to locate schools of Pacific ocean perch. The two trawlers coordinated their echo-sounding and trawling for maximum efficiency of operations.

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Alaska

SOVIET AND JAPANESE FISHING OFF ALASKA, JUNE 1962:

Soviet and Japanese fishing efforts in the Bering Sea and Gulf of Alaska remain high. In the Bering Sea, fishing concentrations appear to have shifted westward, except for the king crab mothership operations of both nations. At last report, the Japanese king crab mothership Tokei Maru was operating just north of Cold Bay. The Soviet king crab vessel Andrey Zakharov was last reported just off Port Moller.



Fig. 1 - Russian king crab factoryship Andrey Zakharov, operating in Bering Sea, July 5, 1961.

Two Japanese shrimp factory vessels were working northwest of the Pribilof Islands at approximately 58° N. 170° W. The two vessels are the Einin Maru and the Kaiko Maru. The Einin Maru's production target is 300,000 cases for 1962. As of June 15 this vessel had produced over 100,000 cases. At the present rate of production, the factoryship is expected to reach its target. She has been on the fishing grounds since May 1 and has been producing an average of 2,500 to 3,000 cases of shrimp a day. The Kaiko Maru is known to be taking large quantities of shrimp also; however, neither her production target nor her fishing success is known.



Fig. 2 - Japanese shrimp factoryship Einin Maru, Bering Sea, June 27, 1961.



Fig. 3 - Japanese whale factoryship Tonan Maru, operating in Bering Sea, July 11, 1961.

Both Japanese and Russian whaling vessels have been reported in considerable numbers along the Aleutian Chain. Most of the activity has been centered around the Amchitka Pass and Rat Islands. The Japanese in particular seem to be having good success this year. Twice they have been observed to find and take a complete school of whales.

Japanese motherships fishing for salmon have not fished in the Bering Sea but have remained south of the Aleutian Islands and west of the 180th parallel, at least during the period from June 7 to June 24.

Soviet and Japanese exploratory vessels have been sighted in many areas of the Gulf. The Japanese exploratory fishing trawler Izumo Maru was prospecting about 100 miles south of Seward. The Russian trawler CT 4454 was sighted approximately 30 miles off Biorka Island near Sitka on June 22. The vessel was believed fishing for ocean perch. At last report, a considerable number of Russian and Japanese trawlers were working near the Trinity Islands off Kodiak.

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SALMON FISHERY TRENDS, JUNE 1962:

Southeastern Alaska: Due to the continued failure of the early runs of salmon to northern waters of Southeastern Alaska, the Icy Strait district and Western district were closed to salmon purse-seining until July 10. Pink salmon to date have been of extremely small size and the number of chum salmon was disappointing. At last report, the only district open to purse-seining in Southeastern Alaska was the outside section of the west coast district.

Central Alaska: The salmon runs to Central Alaska are apparently stronger this year. The Cordova district, which includes the Copper and Bering Rivers, has packed 2,411 cases of kings and 58,866 cases of reds. This indicates a very good run for the Cordova district.

Western Alaska: The red salmon run to Bristol Bay appears to be shaping up about as expected. Last year at this time the pack of red salmon amounted to 303,382 cases. To date this year the pack is 61,091 cases.

* * * * *

HERRING FISHERY:

The herring reduction fishery in Alaska for 1962 began on June 12. The only reduction plant operating this season is the one located at Washington Bay. Although only 3 seiners are fishing, the catches have been so heavy the plant has been unable to keep pace with the deliveries. Approximately 450 tons of herring had been delivered by June 17. The age composition of the catch during the first week was: 19 percent 4-year-old fish, 67 percent 5-year-olds, 13 percent 6-year-olds, and 1 percent 7-year-olds. Catch per unit of effort has been 820 pounds per ton day. This approaches the maximum catch per unit of effort obtained in 1961.

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TANNER CRAB FISHERY:

Trawling explorations in Southeast Alaska for marketable tanner crabs (*Chionocetes bairdii*), undertaken in mid-May by a Juneau firm with the vessel Neptune, were discontinued in mid-June after a thorough search failed to reveal commercial concentrations in trawlable waters. Depths from 10 to 110 fathoms were surveyed near Juneau, in Icy Strait, Northern Lynn Canal, and offshore at Cape Fairweather. The catch in each area averaged 100 market-size tanner crabs per one hour drag; about 50 percent of the crabs had recently moulted and were soft.



Alaska Fisheries Investigations

The following is a report of June 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska.

HERRING INVESTIGATIONS:

The herring tag recovery apparatus at the Washington Bay herring reduction plant was activated early in the month. This operation is part of a biological research study to define the contributions of various stocks of herring to the commercial fishery, to plot migration routes, and to obtain an estimate of natural and fishing mortality in herring populations.

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SALMON FRY MIGRATIONS:

The salmon fry migration from Grassy Point Creek at Karluk Lake dropped to a very low level in the first week of June, whereas the Meadow Creek run peaked at that time. Both camps were closed by June 23, with the arrival of adult reds off the creek mouths. Between 266,000 and 327,000 fry migrated from Grassy Point into Karluk Lake during the study period. Meadow Creek contributed between 650,000 to 728,000 fry during the same period. The smolt out-migration from Karluk Lake for the period May 18 through June 23 was estimated at 1,494,000. This estimate includes both tails of the migration curve. The spring adult red salmon migration into Karluk Lake up to and including June 21 has totaled 104,494 spawners. The run was sampled every fourth day to obtain length, sex, and age data. Four high-seas tagged reds had passed through the weir.

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BRISTOL BAY RED SALMON STUDIES:

The red salmon out-migration from the Naknek Lakes was the largest since the Naknek smolt studies started in 1956. This year an estimated 15,000,000 red salmon smolt left the Naknek Lakes. The previous peak year was 1959, when the smolt out-migration was estimated at 12,000,000. The Ugashik River smolt out-migration was very large also, with the index catch being within a few thousand of the 1958 peak index catch of 456,000. The out-migration estimate for this year is nearly 16,000,000, while the 1958 out-migration estimate was 11,000,000.

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KING CRAB STUDIES:

All research data collected by the Bureau's Montlake Biological Laboratory on king crab south of the Alaska Peninsula have been transferred to the Auke Bay Biological Laboratory in Alaska. The Auke Bay Laboratory

is now responsible for tag recovery and analyses of king crab data resulting from the trawl survey conducted in cooperation with the International Pacific Halibut Commission. In mid-June, the Commission began a second trawl survey of the continental shelf bordering the Gulf of Alaska. Operations will extend from Kodiak Island to Cape Spencer and will use three trawlers. Plans were made to place a Bureau observer aboard one Commission vessel which will operate out of Kodiak. Arrangements have also been made to charter the 80-foot vessel Paragon to tag king crabs in the offshore waters between Chirikof Island and the Shumagin Islands.

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PACIFIC HERRING MAY BE SERIOUS PREDATOR OF PINK SALMON FRY:

Studies of the early salt water life of pink salmon at Little Port Walter in southeastern Alaska indicate the Pacific herring may be a serious predator of pink salmon fry in that area, according to an article in the latest Transactions of the American Fisheries Society, an international fisheries research publication.

In May 1960, the stomach contents of 537 herring were examined by the author of the article. The fish had been caught by beach seines and gill nets fished in the bay near the stream mouth during the peak of the pink salmon fry migration. He found that 286 herring stomachs held pink salmon fry. The average number of fry in each stomach was 14.

The author, who is a biologist at the U.S. Bureau of Commercial Fisheries Laboratory at Auke Bay, Alaska, stated that herring appear in the bay at Little Port Walter occasionally throughout the year. He said the herring often concentrate there in large schools during the spring and summer months, the same time young pink salmon enter salt water from the spawning streams.

Observations by other biologists confirm the report of herring eating salmon fry. A biologist for the Fisheries Research Institute, University of Washington, observed herring chasing and eating salmon fry in Uyak Bay, Kodiak Island, during 1958 and 1959. He examined the stomachs of herring caught by beach seine in Browns Lagoon, Uyak Bay, and found as many as 10 fry in a single herring stomach. In 1962, another Bureau of Commercial Fisheries biologist

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repeated many of the observations made by the author of the article on herring predation upon pink salmon fry entering the Little Port Walter estuary.

The addition of herring to the list of salmon predators does not necessarily mean that predation by herring is general. According to the Auke Bay Laboratory biologist, the extent and areas of predation are not known. He pointed out, however, that the Little Port Walter observations, and those made at Uyak Bay, demonstrate that predation upon salmon fry by herring does occur in widely separated areas, and has been observed upon several occasions in different years.



Alaska Fisheries Exploration and Gear Research

TRAWLER CHARTERED FOR KING CRAB EXPLORATIONS:

The steel-hulled Seattle trawler Yaquina, a 75-foot vessel, was selected in June 1962 for this summer's work by the Bureau's Exploratory Fishing and Gear Research Base, Juneau. A contract charter was signed early in July. The vessel departed for Portlock Bank near Kodiak Island to begin a six-week survey of the commercial potential of king crab and associated stocks. The vessel is expected to be used continuously until November on two additional six-week surveys, one for Seward area shrimp explorations and the other for Southeastern Alaska bottomfish explorations.



American Dietetic Association

ANNUAL MEETING:

The 45th Annual Meeting of the American Dietetic Association will be held in Miami Beach, Fla., October 9-12, 1962. Daytime sessions for the first three days will be held at the Auditorium where an extensive exhibition of food service equipment and food products will be on display. On the last day, sessions will be held at the Deauville and Carlton, the joint headquarters hotels.

Several sessions will be devoted to diet and nutrition. Attention will be given to atherosclerosis and one of the speakers on

this subject will talk on "Fats, Rats, Chicken, and Men." A session on obesity and weight control will include a talk on "Nutritional Deficiencies in Other Parts of the World." Disaster feeding and civil defense will be considered at another session.

Food service administration will be the subject of another session. An associate professor of Michigan State University will talk on new trends in foods. Another speaker will talk about producing quality foods. One speaker will discuss merchandising food, and another, "New Trends in Food."



California

MIDWATER TRAWLING FOR SALMON FINGERLINGS CONTINUED:

M/V "Nautilus" Cruise 62-N-6b (June 11-15, 1962) and 62-N-6c (June 25-29, 1962): The capture of marked salmon fingerlings on their seaward migration was the objective of both trips by the California Department of Fish and Game research vessel Nautilus. The vessel operated in the Carquinez Strait, using a cotton midwater trawl with a 15-foot square opening. Trawling was conducted between 8 a.m. and 3 p.m., and each tow lasted 20 minutes. All tows were alternated between upstream and downstream, and between north shore, center, and south shore of the channel.

Other Species Caught by Nautilus on Cruise 62-N-6b and 62-N-6c

Species	Number
Northern anchovy (<u>Engraulis mordax</u>)	46,000 (est.)
Pacific herring (<u>Clupea pallasi</u>)	11,500 (est.)
Striped bass (<u>Morone saxatilis</u>)	3,600 (est.)
Sacramento smelt (<u>Spirinchus thaleichthys</u>)	2,000 (est.)
King salmon (<u>Oncorhynchus tshawytscha</u>)	755
Northern midshipman (<u>Porichthys notatus</u>)	25
American shad (<u>Alosa sapidissima</u>)	24
Splittail (<u>Pogonichthys macrolepidotus</u>)	24
Jacksmelt (<u>Atherinopsis californiensis</u>)	13
Starry flounder (<u>Platichthys stellatus</u>)	9
Surfsmelt (<u>Hypomesus pretiosus</u>)	7
Staghorn sculpin (<u>Leptocottus armatus</u>)	2
Walleye surferch (<u>Hyperoplites ardentum</u>)	2
Rainbow trout (<u>Salmo gairdneri</u>)	1
Pacific lamprey (<u>Entosphenus tridentata</u>)	1
Shiner perch (<u>Cymatogaster aggregata</u>)	1
Sacramento squawfish (<u>Ptychocheilus grandis</u>) ¹	1
Night smelt (<u>Spirinchus starksii</u>)	1
Three-spined stickleback (<u>Gasterosteus aculeatus</u>)	1

¹/New species appearing for first time since midwater trawling operations began on April 10, 1961.

A total of 109 tows completed in the Strait during the cruises yielded a total

catch of 755 king salmon (*Oncorhynchus tshawytscha*). Nineteen of these fish were marked recoveries.

Note: See Commercial Fisheries Review, August 1962 p. 9.



Cans--Shipments for Fishery Products, January-May 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-May 1962 was 0.4 percent above that used during the same period in 1961.



Prior to this year, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.

A total of 1,222,507 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first five months of 1962, whereas in the same period of 1961 (when only tinplate was reported), 1,217,306 base boxes of steel were consumed. More tuna, Maine sardines, and mackerel were canned in the first five months of 1962 than in the same period of 1961.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size.



Central Pacific Fisheries Investigations

TUNA STUDIES IN SOUTH PACIFIC CONTINUED:

M/V "Charles H. Gilbert" Cruise 56 (April 24-May 12, 1962): Long-line fishing for tuna and other climax predators in waters adjacent to Christmas Island was conducted during this cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. The specimens obtained were to be used for studies by the University of Washington Laboratory of Radiation Biology.

Five long-line fishing stations were occupied at designated locations shown in figure 1. Sixty baskets of 180-fathom mainline gear

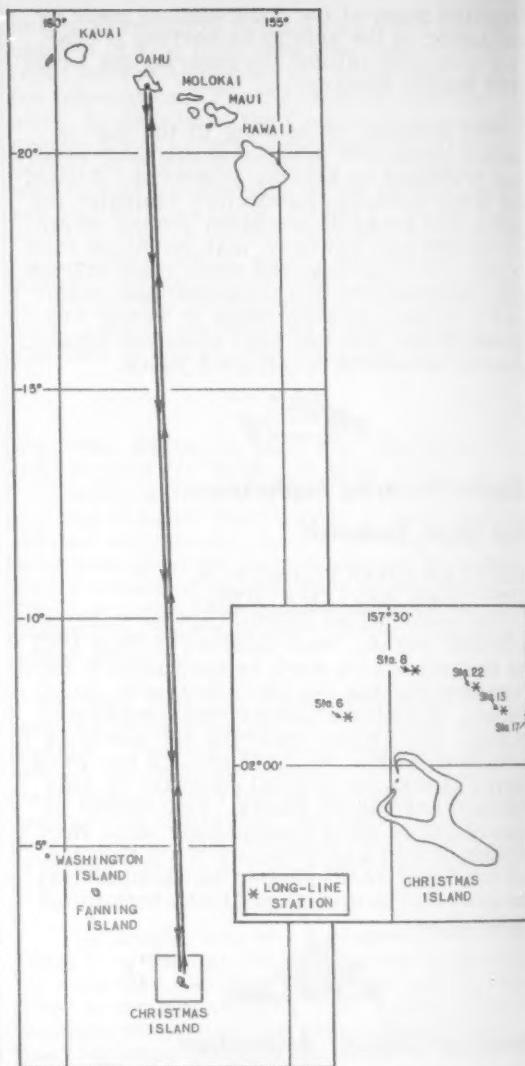


Fig. 1 - Track chart of Charles H. Gilbert Cruise 56 (April 24-May 12, 1962).

with 16-fathom droppers were fished at stations 6, 8, 13, and 17, and 20 baskets of similar gear were fished at station 22. The catch rate of tuna (per 100 hooks) ranged from 1.1 at station 6 to 21.9 at station 13. A total of 154 yellowfin tuna, 9 big-eyed tuna, 1 wahoo, 1 sailfish, 1 black marlin, 1 lancetfish, and 15 sharks were caught at the 5 long-line stations.

Samples of eyes, liver, and muscle were taken from 51 yellowfin tuna, 6 big-eyed tuna,

1 wahoo, and 2 spearfish. Livers were taken from 3 sharks. Those samples, which were taken from long line-caught fish, were frozen for further study by the University of Washington.

Plankton and nekton were collected with 1-meter plankton nets and a 6-foot Isaac-Kidd midwater trawl. Eight 30-minute 0-50 meter oblique plankton tows and three 30-minute surface plankton tows were made with a 1-meter open net. A non-quantitative portion approximately one-fourth of each sample was preserved in formalin. The remainder was frozen. Settling volumes ranged between 205 and 250 ml. Three hauls with the 6-foot midwater trawl were made to a depth of approximately 70 meters.

Water samples were collected to a depth of 1,200 meters using bottle casts. Six Nansen bottle casts (without reversing thermometers) were made to obtain water samples at the following depths: 25, 50, 100, and 300 meters. A five-gallon surface sample was obtained at each of the six stations by bucket.



Collecting tuna blood sample.

Blood samples were collected from tuna and marlin for serological studies at the Bureau's Biological Laboratory, Honolulu. A total of 142 blood samples were obtained from 131 yellowfin tuna, 9 big-eyed tuna, 1 black marlin, and 1 sailfish.

Eighty-two BT casts and collections of surface salinity samples were made on runs between Honolulu and Christmas Island. Casts were made at intervals of approximately 30 miles. Four BT casts were made in the survey area with a surface salinity

sample collected at each. During this cruise, two night-light stations were held in the survey area, and the thermograph was operated continuously.

Four skipjack tuna schools and 17 unidentified schools were sighted during the cruise.

On the run between Honolulu and Christmas Island, one case of drift bottles (20 bottles per case) was dropped each hour for the first 6 hours after departure, and after that, one case was dropped every 3 hours until 15° N. On the return trip, one case of drift bottles was dropped at 15° N. and one case 3 hours later.

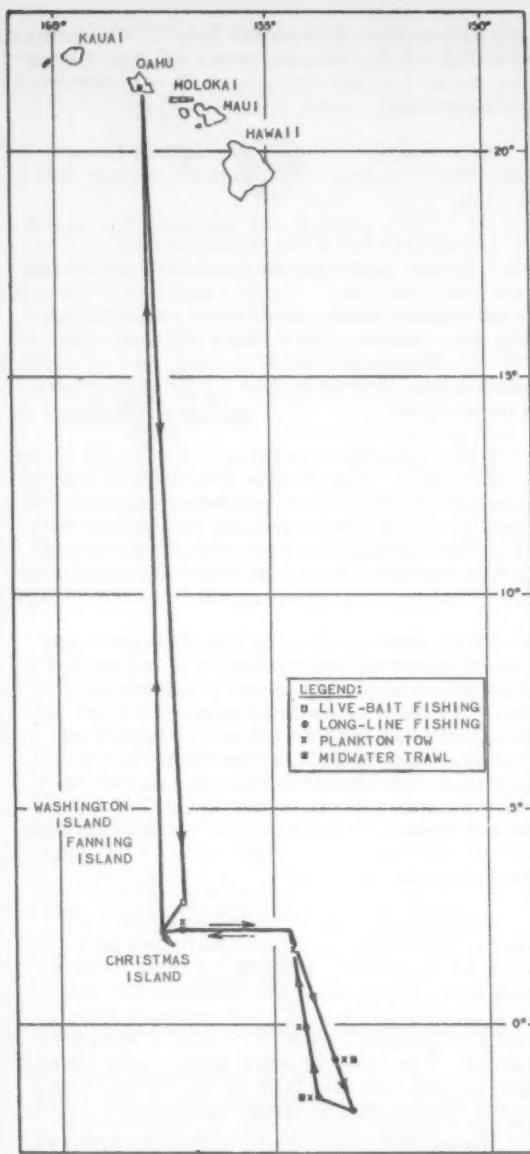
M/V "Charles H. Gilbert" Cruise 57 (June 4-25, 1962): This cruise in the Line Islands area, principally off Christmas Island, by the Charles H. Gilbert was also concerned with long-line fishing for tuna and other climax predators needed as specimens in studies by the University of Washington.

Five long-line fishing stations were occupied at the locations shown in figure 2. Sixty baskets of 6-hook, 210-fathom mainline gear with 16-fathom droppers were fished at each station. The catch rate of tuna (per 100 hooks) ranged from 1.1 at station 16 to 3.9 at station 21. A total of 28 yellowfin tuna, 3 big-eyed tuna, 12 skipjack tuna, 1 wahoo, 1 striped marlin, 1 lancetfish, and 21 sharks were caught at the five long-line stations.

Samples of eyes were taken from 8 yellowfin and 2 skipjack tuna; samples of liver from 27 yellowfin, 3 big-eyed, and 12 skipjack tuna, 1 wahoo, 1 striped marlin; samples of muscle from 27 yellowfin, 3 big-eyed, 12 skipjack tuna, 1 wahoo, 1 striped marlin. The tissues were taken from long-line-caught fish and frozen for further study by the University of Washington.

Plankton and nekton were collected using 1-meter plankton nets and a 6-foot midwater trawl. Thirteen 30-minute 0-50 meter, one 0-100 meter oblique plankton tows, and five 30-minute surface plankton tows were made with a 1-meter open net. Settling volumes ranged from 75 to 1,150 ml. Two hauls with the 6-foot midwater trawl were made to a depth of approximately 55 and 64 meters, respectively.

Water samples were collected to a depth of 300 meters with bottle casts. Five bottle



casts (without reversing thermometers) were made to obtain water samples at depths of 25, 50, 100, and 300 meters. A 5-gallon surface water sample was obtained at each station by bucket.

Blood samples for serological studies were collected from: (1) up to 300 skipjack

taken by live-bait fishing methods, (2) 191 skipjack and 2 yellowfin tuna caught by live-bait fishing at 03° 08' N., 157° 01' W., (3) all tunas and marlins taken by long-line fishing, and (4) 28 yellowfin, 3 big-eyed, and 12 skipjack tuna, 1 wahoo, 1 striped marlin (all of these were caught by long line). Other biological and oceanographic data were collected.

M/V "Charles H. Gilbert" Cruise 58 (July 10-19, 1962): The Hawaiian waters from Oahu to French Frigate Shoals were explored during this cruise by the Charles H. Gilbert.

A total of 37 fish schools (based on sightings of bird blocks) were recorded during the period. Twenty-two of the schools were observed while within the area of the fishery, including the first scouting leg west of Niihau, and 15 schools were observed to the west. One school was composed of yellowfin tuna estimated to consist of fish weighing 125 pounds each, 7 were skipjack, and 29 were unidentified.

One yellowfin, 1 unidentified, and 4 skipjack schools were fished, with a catch from two schools of 39 skipjack. Both the schools were fished in an area 40-60 miles west of Niihau—16 skipjack averaging 25 pounds each were caught from one school and 23 $4\frac{1}{2}$ -pound skipjack from a second school.

Other results of the cruise were:

1. Nine night and 6 daylight surface plankton collections were made using a 1-meter net.
2. Sixteen blood samples were collected from the 25-pound skipjack caught about 60 miles west of Niihau.
3. Trolling for 104 hours resulted in a catch of 13 little tunny, 6 yellowfin, 1 skipjack (4 were lost), 3 dolphin (1 lost), and 1 wahoo. Two little tunny and 2 yellowfin were returned for skeletal studies.

4. Drift bottles and cards were released in groups of about 100 at four locations off eastern Oahu, namely Manana Island, Kailua Bay, Mokoli'i Island, and Laie Point.

5. Live bait was obtained from three sources: (a) mosquito fish from airport drainage ditches, (b) tilapia from the State Fish and Game bait plant, and (c) iao from French Frigate Shoals.

Note: See Commercial Fisheries Review, June 1962 p. 8.

Crab Meat

NEW CRAB-PICKING MACHINE INVENTED:

A power-driven crab-picking portable machine that could revolutionize crab processing has been invented in North Carolina. Francis Altman, the inventor, who is manager of a crab-processing plant in Oriental, N. C., believes that the machine is the first of its kind to use a dry process. The inventor holds the patent rights jointly with another resident of Oriental, N. C. The latter and his brother jointly own two crab plants in North Carolina which process and pack a pasteurized brand of crab meat--one is located in Oriental and the other in Whortonsville.

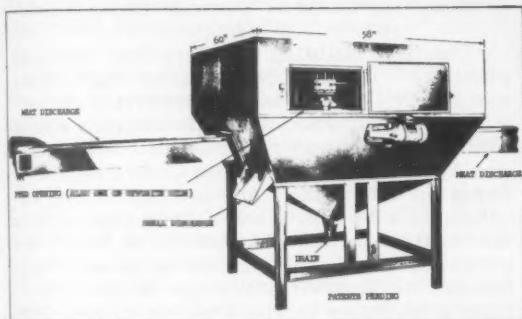


Fig. 1 - Sketch of crab-picking machine. Shows some detail of the various parts of the machine.

Built of stainless steel, the portable machine is fed from both sides. The meat is separated from the shell cleanly, and then comes out on a conveyor and is raked into cans. The crab meat is still encased in the shell when it is fed into the machine that the patent-right holders have named "The Crab Master." Three people are needed to operate the machine. Two feed it, the other rakes in the meat. Some 15 to 17 workers will be required to "deback" and "bob" the crabs before they can be placed in the picking machine. By hand the crab is first debacked--that is, its hard top shell is removed; then its meaty portions are cut into pieces about the size of ordinary cup cakes. These portions are placed by women into rotary cups. Each of the rotary containers has eight unit heads. The portions fit snugly in the cups. A fast worker can feed the bobbed portions into each side of the machine at a rate of up to 150 per hour.

"This machine," the inventor states, "will actually do the work of 60 to 70 workers and require the services of not more than 20 persons in the course of an eight-hour work day." This means that the machine and 20 workers can process as much crab meat in an eight-hour day as 60 to 70 women workers now produce by using the age-old method of picking the meat from the shells by hand.

Altman spent more than two years in building the crab meat picker. The machine costs about \$8,000 to build. The inventor has demonstrated his machine to crab processors in North Carolina and other states. The North Carolina Board of Conservation and Development and its chairman, the Governor of North Carolina, have expressed great interest in the new machine.

The machine will be manufactured by a company in Baltimore, Md. Plans at present are to build at least 12 of the machines in addition to the prototype model the inventor is now demonstrating. The present holders of the patent rights plan to retain the patent rights. They plan to lease the machine to crab processors at the rate of about \$3 per hour. The machine will not be sold outright.

Crab processing is a fast-growing industry in North Carolina. In 1961, according to the U. S. Bureau of Commercial



Fig. 2 - Francis Altman, right, beside the crab-picking machine he invented. At Oriental, N. C., a crab-processing plant employee feeds bobbed crabs into the machine where the meat is separated from the shell. The machine is patented.

Fisheries, North Carolina ranked fourth in landings of hard blue crabs in the Nation with a record of more than 16 million pounds. Under North Carolina law, blue crabs can be taken year-round.

Pasteurized crab meat is taking its place in the crab industry of North Carolina. North Carolinians eat some crab meat, but the State's processors find their best markets for about all they can process in Baltimore, Philadelphia, and New York City, where it is shipped daily under contract. (News release dated July 15, 1962, from the North Carolina Department of Conservation and Development.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JUNE 1962:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased in June 1962 by the Defense Subsistence Supply Centers than in the previous month. The decline was 6.8 percent in quantity and 7.6 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, June 1962 with Comparisons

QUANTITY				VALUE			
June 1962	Jan.-June 1961	June 1962	Jan.-June 1961	June 1962	1961	June 1962	1961
2,357 (1,000 Lbs.)	1,593 (11,973)	10,872		1,328 (\$1,000)	702	6,762	5,311

Compared with the same month a year earlier, purchases in June 1962 were up 48.0 percent in quantity and 89.2 percent in value. This shows that higher-priced fishery products were purchased this June because the value of the purchases increased

much more than the quantity. During the first six months of 1962, purchases were up 10.1 percent in quantity and 27.3 percent in value as compared with the same period in 1961. Again, because of the purchase of higher-priced fishery products and an increase in the price of most fishery products, the value increased more than the quantity.

Prices paid for fresh and frozen fishery products by the Department of Defense in June 1962 averaged 56.3 cents a pound, 0.6 cents a pound less than in the previous month, but 12.2 cents a pound more than in the same month of 1961.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, June 1962 with Comparisons

Product	QUANTITY		VALUE	
	June 1962	Jan.-June 1962	June 1962	Jan.-June 1962
	(\$1,000)		(\$1,000)	
Tuna . . .	1	-	3,707	2,662
Salmon . . .	-	1,015	2	-
Sardine . . .	18	1	50	90
All/Less than \$1,000				

Canned: Canned sardines were the principal canned fishery product purchased for use of the Armed Forces in June this year. For the first six months of this year purchases of canned tuna and salmon were up substantially as compared with the same period of 1961. But purchases of canned sardines during the first half of 1962 were down because of the short packs of both Maine and California sardines during 1961. Purchases of the three principal canned fishery products (tuna, salmon, and sardines) in the first 6 months of 1962 were up 73.3 percent in quantity and 123.2 percent in value as compared to the same period in 1961. The greater increase in value was due to larger purchases of canned salmon and an increase in the price of canned tuna.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Fish Meal

NEW PLANT PROPOSED FOR CAPE CHARLES, VA.:

A new fish meal processing plant is planned at Cape Charles, Va. The plant will be in operation early in 1965, according to the "Virginia-Pilot," a Norfolk, Va., news-

paper. The new facility will represent a plant investment of about \$1,750,000 with an annual payroll of from \$300,000 to \$400,000. An industry spokesman stated the operation will be carried on by a wholly-owned firm.

The factory is estimated to cost \$750,000, and will be located on Cape Charles Harbor on land owned by the Pennsylvania Railroad. The remainder of the plant investment will go for a fleet of six vessels costing from \$150,000 to \$200,000 each. It was reported that about 100 men will be employed on the vessels, and some 50 persons in the plant.

The firm building the plant now operates plants in Wildwood, N. J., Moss Point, Miss., and Reedville, Va., but the Reedville plant will be closed when the Cape Charles operation begins. It was reported that the firm was approached by both the Cape Charles township and by the Railroad concerning location of the plant. One of the advantages of the location is that it is nearer to both Chesapeake Bay and Atlantic fishing areas than Reedville. Another advantage is that the plant's products can be shipped by rail from Cape Charles, which is not the case at Reedville.



Fishy Odors and Flavors

PROGRESS ON STUDIES TO DATE (JUNE 1962):

In 1955 the U. S. Bureau of Commercial Fisheries initiated its first program on the chemistry of fishy odors and flavors by awarding a contract for the study to the Hormel Institute, University of Minnesota, Austin, Minn. At that time, the potential causes of such fishy odors and flavors had not been thoroughly understood. The assumption was made that the primary cause of such odors was an oxidative splitting of the polyunsaturated fish oil fatty acids to shorter chain carbonyl compounds, some of which possess fishy odors and flavors.

Dr. Jacques Chipault of the Hormel Institute began a comprehensive investigation of the chemistry of the oxidation of fish oils. Menhaden oil was oxidized by aeration and the numerous carbonyl compounds as musty, stale, sharp-acrid, putrid, and sweet.

Work on Odors and Flavors at the Seattle Laboratory: Quite independent of the fish oil

program, the Bureau's Technological Laboratory at Seattle conducted a study aimed at finding the chemical nature of compounds responsible for the fishy odors and flavors resulting from spoilage of the protein and other nitrogenous components of fish. This work was started by David Miyauchi in 1956 and continued after 1957 by Dr. Herman Groninger. Maurice E. Stansby, the Director of the Laboratory, noted that many of the odors being found associated with spoiled fish in this research by Miyauchi and Groninger seemed also to occur in many of the menhaden oils mixed in with various rancid or otherwise oxidative types of odors.

Stansby, therefore, carried out some experiments, some of which were first reported at a conference of fishery technologists at Davis, Calif., 1959. This work was continued and a paper, "Speculations on Fishy Odors and Flavors," appeared in Food Technology, April 1962 (pages 28-32). In this paper the idea is presented that we should not distinguish sharply between fishy flavors in spoiling fish resulting from bacterial decomposition and fishy flavors in oxidizing oils. Rather, it is shown that these phenomena probably occur together in each case. Thus in fish oil, the fishy flavor may be due to chemical changes involving both straight oxidation of the fatty acids in fish oil, but also changes in small traces of nitrogen, phosphorous, sulfur, or other components present in the oil may also play an important role. Work along this line from a general point of view is continuing at Seattle. Although Dr. Chipault began in 1959 some work on the possibility of some of these trace components of fish oils being involved in fishy odors in fish oils, it was felt that so many aspects were now involved in the mechanism of fishy flavor development, that additional effort was needed to prevent Dr. Chipault's research from being spread over too many aspects.

Research on Fishy Flavors: Accordingly, in 1960, a contract project was awarded for Dr. Mangold to investigate mechanisms for fishy odor and flavor development over and beyond straight oxidative deterioration. Dr. Mangold, previous to any contract work with the Bureau, had collaborated informally with Malins of the Seattle Laboratory in the adaptation of thin-layer chromatography to the analysis of fish oils. This research has been of tremendous importance not only to the fish oil program, but also to lipids chemistry in general. Before Mangold and Malins' research, thin-layer chromatography was an

almost unknown technique used in very few laboratories, and it had never been applied to lipids. Largely as a result of the efforts of Mangold and Malins, this new technique was adapted to the lipid field, and today this method is finding rapidly increasing use in hundreds of laboratories in this country and elsewhere throughout the world. For two papers, which Mangold and Malins presented on thin-layer chromatography before the American Oil Chemists' Society, they jointly received a year ago the Bond Award for the best paper on oil chemistry of the year. Thin-layer chromatography as adapted by Mangold and Malins to fish oils is becoming of great value to the fish oil program, especially with respect to monitoring reactions in preparing fish-oil derivatives. By applying this new technique, it is now possible to improve upon such reactions, some of which had previously been studied and had to be discarded because in the past the analytical methods had not been good enough to follow all of the reactions occurring.

When Dr. Mangold received his first contract from the Bureau on the fish oil program, the first problem was to have available rapid methods for separation and determining the various nitrogen, phosphorous, and sulfur compounds suspected of being partially responsible for fishy flavors and odors in menhaden oil. He, therefore, developed thin-layer chromatographic methods for analysis in fish oils of small traces of such compounds as mercaptans and amines. A paper describing these methods was published in 1962 (Mangold and Kammereck, *J. Am. Oil Chem. Soc.*, vol. 39, pp. 201-206.) The method is currently being used to analyze fish oils to determine whether any of these types of compounds are associated with fishy odors common in fish oils.

Another approach to fishy odors in fish oils is also being investigated by Dr. Mangold. It is known that fish oils can be completely deodorized and yet these will have reversion of the fishy odor or flavor. This return of a fishy odor or flavor sometimes occurs either in the absence of oxygen or when so little oxygen is present that some mechanism other than oxidation is suspected of being responsible. With some foods other than fish, a mechanism has very recently been proposed to account for similar behavior. It has been shown that some oils contain certain precursors of fishy or other off-flavors. These precursors are not just the triglycerides or fatty acids. Rather they

are a class of compounds related to plasma-gens, which have been termed "aldehydogenic compounds." These are labile compounds containing an ether linkage. They readily break down to aldehydes that possess fishy or similar flavors and odors. Dr. Mangold is currently looking into the possibility that such compounds may play a role in the mechanism of fishy flavor formation in menhaden oils.

Recent Work of Dr. Chipault: Since Dr. Mangold has been assigned to work in the area which Dr. Chipault had started to investigate on "fishiness" resulting from reactions other than mere oxidative rancidity, Dr. Chipault's current project deals with investigation of odoriferous and other compounds formed from relatively pure highly polyunsaturated fish-oil fatty acids such as the C22 hexenoic fatty acid. This phase of the work was started in mid-1962. It is felt that past work of Dr. Chipault carried out in the early stages of the program (1955-1959) has demonstrated that the situation during oxidation of fish oil triglycerides is too complicated for a reasonably small program to elucidate all the complex reactions. The present approach is being used because it is felt that the use of model systems with lesser numbers of reactants will enable the mechanism of fishy-rancid odor and flavor development to be much more quickly investigated. Some somewhat similar studies are also in progress at the Seattle Laboratory of the Bureau in a program unrelated to the fish oil program yet which involves oxidation of relatively pure fish oil polyunsaturated fatty acids. This research, which is financed by the Atomic Energy Commission, may eventually be of aid in accelerating results on the program on fishy odors in fish oils as currently being studied by Dr. Chipault.

Inter-relationship Between Program of Contractors at Hormel Institute and Other Research at Seattle Laboratory: Several programs as listed below are being carried out at the Bureau Laboratory at Seattle, most of which are not directly a part of the fish oil program, yet which are giving results that are furthering the efforts of the contract research on fishy odors and flavors being carried out at Hormel Institute. These programs are as follows:

<u>Program</u> Compounds Forming in Spoiling Fish Nature of Compounds Responsible for Fishy Odors Effect of Irradiation on Fish Oil Fatty Acids
--

<u>Investigator</u> Dr. Groninger M. E. Stansby Dr. Stout
--

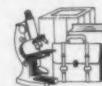
Furnishing Palatable Fish Oil for Research at Other Institutions
 Stability of Fish Oil and Derivatives

Gauglitz
 Houle

It has been found throughout the contract investigations on fishy odors and flavors that it is highly desirable to maintain the closest liaison among the various projects concerned with this work. The biggest problem from this standpoint is the definitions of vocabulary terms describing various odors and flavors. Such subjective words as musty, stale, sweet, etc. mean different things to different people. For example, at Seattle Dr. Groninger was using "stale" to denote the same odor as Dr. Chipault at Hormel Institute had termed "fishy." On one occasion Dr. Chipault ran into a new type of odor which he tried to describe in words but which meant nothing to other investigators. Later it developed this was an odor which had been known at the Seattle Laboratory for many years and had always been described as "sweet."

In order, so far as possible, to eliminate these difficulties, a series of workshop sessions has been held between personnel of the Seattle Laboratory and those of the Hormel Institute. For example, two such sessions were held last year, one at Seattle attended by Hormel Institute personnel and one at Hormel Institute attended by Stansby. At the latter session, Stansby took back dozens of samples of fishery products having many different odors and flavors. These samples were examined and terminology discussed. A similar session was scheduled during September 1962 in Seattle.

There are other ways in which cooperation among these various programs is very helpful. An example of this concerns the Seattle production with the large-scale molecular still of gallon quantities of palatable fish oil for research by outside agencies. In the course of this work, concentrates of "fishy" odors and flavors are removed during the refining steps. These are often sent to Dr. Chipault and/or Dr. Mangold as sources of compounds for their research into the chemistry of fishy odors and flavors. Also, some of the purified oils may still retain different types of fishy flavors and sometimes portions of these oils are sent for research at the Hormel Institute.



Fish Farming

FISH CROP FROM FLOODED RICE LANDS:

Ways to improve the production of fish on flooded rice lands are being studied at the new Fish Farming Experimental Station at Stuttgart, Arkansas, by the U. S. Bureau of Sport Fisheries and Wildlife. All completed experimental ponds at the new station had been filled with either surface or ground water and stocked with fish by June 1962.

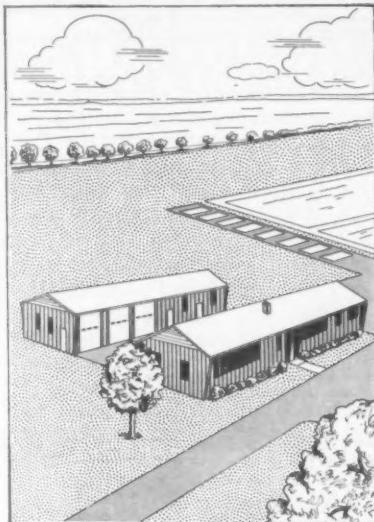


Fig. 1 - Sketch of the Fish Farming Experimental Station, Stuttgart, Arkansas.

Some of the ponds were fertilized to encourage a growth of algae. The amount of fish harvested from any area is directly related to its fertility. Basic units in the con-

version of inorganic elements to proteins and carbohydrates are the tiny microscopic plants known as algae. With the aid of energy from the sun, these tiny organisms form the initial food particles which will ultimately end in a food fish. Tiny animals known as zooplankton feed on the algae. These are, in turn, consumed by small fish of nearly all species. Small fish are then pursued by predators which will eventually provide food for man. Such a cycle is known as a Food Chain.

If the proper inorganic elements are lacking in a pond, few, if any, of the needed plants can grow and the pond is said to be infertile. In such cases commercial fertilizers are often added to encourage a "bloom" or growth of algae. Precautions must be taken to avoid over-fertilization lest an excessive bloom occur and cause an oxygen depletion on a hot, cloudy day.

All species of fish are dependent upon zooplankton during their early life stages. In stocking a properly fertilized pond or reservoir, fishery biologists recommend using a variety of species which will use all of the available food with a minimum of competition among the species. Variations such as bluegill-bass; catfish-minnows; or catfish-buffalofish-bass are desirable combinations. Carp may be added to these combinations to control excess vegetation. It is possible, however, to raise only a single species in a pond or reservoir.

The ponds at the Experimental Station at Stuttgart were stocked with different combinations of species at varying rates. The Marion National Fish Hatchery supplied

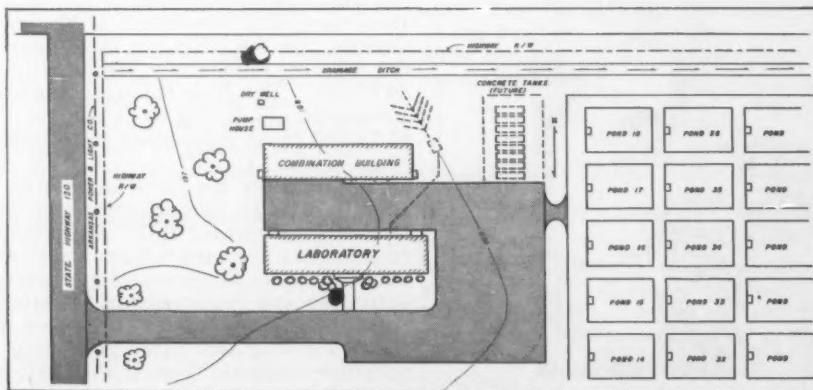


Fig. 2 - Diagram showing arrangement of the Station.

40,000 channel catfish and 12,000 crappies; the Corning National Fish Hatchery furnished 10,000 fingerling bass; and the Arkansas State hatchery at Lonoke, Arkansas, provided large-mouth buffalofish, fathead minnows, and Israeli carp. Two flathead catfish had been spawned successfully at the station by June 1962.

Field studies are being made at the Station to (1) determine the species of fish best suited for culture; (2) find methods for efficiently spawning fish and producing fingerlings for stocking purposes; (3) develop economical methods for raising desirable fish to a useful size; (4) develop controls for undesirable species of fish; (5) develop suitable methods for harvesting fish; (6) develop controls for aquatic weeds; and (7) determine, in cooperation with the Department of Agriculture and the Rice Branch Experiment Station, the effects of fish-rice rotations on soil fertility.

Laboratory research includes studies on (1) parasites and diseases affecting fish raised in reservoirs and the development of control measures; (2) the effect of environmental changes on the physiology of fish; (3) the effects of agricultural chemicals on fish survival; (4) the nutritional requirements of fish; (5) improvement of strains of fish through selective breeding and mutation; and (6) improved techniques for spawning fish through the use of hormones and manipulation of the water quality.

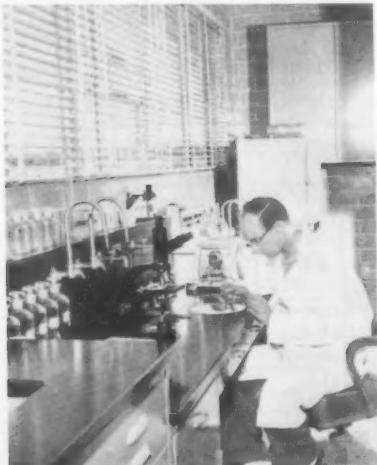


Fig. 3 - Biologist examining specimens in the laboratory at Stuttgart.

Research facilities are provided with both surface and ground water, and with air, gas, and electrical outlets. Office-laboratories for the research staff are equipped with the latest in scientific equipment.



Fish Protein Concentrate

BAKERY PRODUCTS WITH CONCENTRATE SAMPLED BY TASTE PANEL:

During a recent palatability test in Seattle, Wash., only 8 men of a group of 33 were able to guess correctly which products contained fish protein concentrate. All of the men in the group were associated with the fishing industry. A U. S. Bureau of Commercial Fisheries home economist served the group butter cookies and bran muffins with and without fish flour. Each person rated the products on palatability score sheets. Out of a possible perfect score of 100 percent, the products scored as follows:

<u>BUTTER COOKIES</u>	
Sample A with fish protein concentrate	90.58 percent
Sample B without fish protein concentrate	88.52 "
<u>BRAN MUFFINS</u>	
Sample A with fish protein concentrate	89.06 percent
Sample B without fish protein concentrate	88.43 "



Florida

NEW FISH BEHAVIOR LABORATORY:

Construction of a fish behavior laboratory at the University of Miami is expected to begin this year, according to the Director of the University's Institute of Marine Science. Grants totaling \$300,000 have been received for the new laboratory, which will cost \$470,000. The International Oceanographic Foundation is trying to raise the remaining \$170,000 from interested fishermen.

This will be the first laboratory designed specifically for investigations of the behavior of living salt-water fish. Fourteen thousand square feet of research area will be equipped with the latest apparatus for studying the activities and responses of all kinds of marine life. Every laboratory room will have clear, running sea water with accurate temperature control. There also will be instruments for precise control of water sound, light, and chemical action.

Utilizing this new Controlled Environments Building, scientists will be able to duplicate sea conditions or even to create a new environment for animals under study, using complex instruments to record their reactions. The building's design permits living specimens to be transferred from the sea to tanks with maximum safety. Special pressurized tubular tanks up to 40 feet in length will enable investigators to study extremely large fish under simulated conditions of great depth. Water in the tanks will be regulated for temperature, salinity, oxygen, carbon dioxide, acid-base relationship, and cloudiness. Filtered rooftop settling tanks will provide up to 600 gallons of water a minute.

Complex electronic equipment will record and measure the nervous reactions of fish to various stimuli. In addition, there will be facilities for studying responses to the earth's magnetic field; rooms shielded from magnetic attraction, outside sound and light; and at least one laboratory equipped with a Faraday cage to screen out outside interference while minute electrical impulses from nerves and muscle tissue are recorded.

The new laboratory will help find answers to many questions that have plagued fishermen and marine scientists alike: How and why do fish migrate? What system of biological navigation do they have? Why do they feed only at certain times? Why do they prefer different types of bait on different occasions? In short--what goes on in the mind of a fish?

Emphasis will be placed on "pure" science investigations such as studies of porpoise communication by sonar and the current research of the Institute on shark hearing systems, but the practical byproducts of such a facility should be of value to fishermen. From its research projects may come new and effective forms of shark control, improved baits and lures, new data on the feeding habits and times of game fish, and accurate charting of the migrations of school fish.

Note: See Commercial Fisheries Review, July 1962 p. 17 and May 1962 p. 19.



Great Lakes

LAKE TROUT PLANTED IN LAKE MICHIGAN FROM FERRY:

Experimental plantings of lake trout from the National Fish Hatchery, Charlevoix, Mich., were made during the early summer of 1962 in Lake Michigan, directly from the Chesapeake and Ohio Ferry as it passed over the Milwaukee Reef. Nearly 73,000 lake trout weighing more than 3,800 pounds, were successfully planted in that way. Personnel and equipment from the State of Michigan's Department of Conservation assisted in the operation.

* * * * *

OUTLOOK PROMISING FOR TRAWLING IN LAKE MICHIGAN:

The future looks promising for trawl fishing in Lake Michigan with the start of the 1962 summer fishing season. In June, State of Michigan-licensed commercial fishermen had firm orders for all the chubs they could catch, plus a fair amount of alewives.

A freezer with a 2-million-pound capacity is being built at the dock in Saugatuck, Mich. Ice machines, forklift, and other equipment were ordered, and the facility was expected to be in operation by late June or early July. The equipment and docking facilities are being financed by a Saugatuck construction company which has confidence in the future of the fish business in Lake Michigan.

Details of the sea lamprey and lake trout programs for Lake Michigan were discussed by U. S. Bureau of Commercial Fisheries personnel at a meeting in Milwaukee on June 15, 1962. The meeting was attended by members of the United States section of the Great Lakes Fishery Commission to discuss problems concerning the budgets and program of the Commission.

* * * * *

ORGANOLEPTIC EVALUATION OF FRESH-WATER HERRING:

Because of increased interest by the Lake Superior fishing industry to better utilize lake herring from that Lake, the U. S. Bureau of Commercial Fisheries technological laboratory at Ann Arbor, Mich., has been making an organoleptic evaluation of herring products. About early summer, various lake herring products were placed in cold-storage at 0° F.

to obtain preliminary information as to the effects of processing variables on their quality.

Fillets, headed and gutted, and whole herring, with no glaze, an ice glaze, or an alginate glaze were individually heat-sealed in cellophane pouches. Breaded herring fillets were also put up, replacing the conventional egg batter in one lot with a thin alginate dip before applying the breading. The samples are being held at 0° F. and are scheduled for periodic organoleptic examinations, following final processing (to a breaded fillet and deep-fat frying).

A one-month examination of the various herring fillet products in storage was conducted early in July 1962. The one-month examination did not reveal any marked differences between lots of fillets or with the control, although the products treated with alginate received slightly fewer deduction points for flavor and texture defects. The examinations are to be continued at regular intervals.



Great Lakes Fishery Investigations

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 2 (June 4-14, 1962): Spring environmental conditions were studied at three limnological stations in the Apostle Islands region--southeast of Stockton Island, northeast of Bear Island, and in Pike's Bay. Routine limnological collections included records of water temperatures, Secchi-disk readings, water samples for chemical analyses, and bottom and plankton samples. The water temperature did not change during the early part of the cruise, but by mid-June surface water temperatures in some areas had reached 55° F. Secchi-disk readings ranged from 10 feet in Pike's Bay to 25 feet northeast of Bear Island. Plankton abundance was relatively low at all stations.

Studies were continued on the distribution and abundance of native and hatchery-reared lake trout in the Apostle Islands area. Most of the lake trout caught in that area were from the 15- to 25-fathom depth range.

With the completion of Cruise 2, the Siscowet in 1962 had captured 497 small lake

trout, of which 477 (96 percent) were fin-clipped. Of the recaptured hatchery-reared fish planted before 1962, a total of 252 (64 percent) were from the 1961 Bayfield shore plant, 115 (29 percent) were from the 1960 shore plant, and 22 (6 percent) were from the 1959 boat plant. Those returns support evidence obtained during the 1961 season that the success of the 1960 plant was excellent, and that results from the 1959 plant were poor. The first-year survival of the 1961 plant appeared to be excellent.

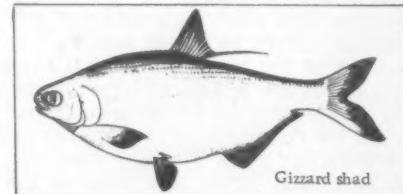
Trawling with the Siscowet during, and immediately after the release of approximately 20,000 lake trout from shore, confirmed observations made in 1961 that the fish reach suitable trout habitat (15 fathoms, 1 mile from shore) in 3½ to 4 hours after planting.

Note: See Commercial Fisheries Review, Aug. 1962 p. 18.

* * * *

LAKE ERIE FISH POPULATION SURVEY CONTINUED:

M/V "Musky II" and M/V "Madtom" (July 1962): Vessel operations in July were mainly exploratory, and to ascertain the relative abundance and distribution of young-of-the-year fish. The Musky II made 35 offshore trawl tows, mostly in the Sandusky and Islands regions. The Madtom, a 16-foot outboard craft, made 55 tows at depths of 4 to 15 feet in selected areas along the south shore, between Monroe, Mich., and Barcelona, N. Y. Numerous fish collections were preserved and measurements recorded for later analysis.



Gizzard shad

In the western basin, the 1962 hatch and survival appeared to have been exceptionally good for yellow pike, yellow perch, white bass, alewives, gizzard shad, and spot-tail shiners. Collections later in the season will be necessary to fully evaluate the spawning success of channel catfish, sheepshead, emerald shiners, and smelt. In general, however, a good year was indicated for most species.



Young-of-the-year (yellow pike) and yellow perch were uniformly distributed throughout the western basin. Approximately 700 yellow pike were caught during July alone, which far exceeded the number of fingerlings taken in any previous year. A single 10-minute tow yielded an estimated 70,000 young yellow perch, and many other tows yielded 5,000 to 10,000 of that species. Collectively, the tows averaged about three times as many young yellow perch as were caught in 1959—the year in which the largest previous year-class on record was produced. Yellow perch (and the young of most other species) were caught at depths of 5 to 10 feet. Yellow pike were most numerous at depths of 10 to 12 feet.

In contrast to the abundance of small fish in the western basin, trawling with the Madtom for 3 days along the south shore of the central and eastern basins revealed only limited numbers of young fish. The fish were considerably smaller than in the western basin, probably because of the later hatching period and cooler water temperatures. Large numbers of yellow perch were observed in the harbor at Erie, Pa. No young yellow pike were caught east of Vermilion, Ohio.

In the western basin, the growth of the young of all species appeared to be generally comparable to growth in other years. By the end of July, yellow pike were averaging 5 inches in length; yellow perch, $2\frac{1}{2}$ inches; and white bass, 2 inches.

The Musky II made biweekly visits to two stations in the central basin as part of a continuing study of oxygen deficiencies at the lower depths. Dissolved oxygen determinations and depth casts were made at 5-mile intervals. Oxygen deficiencies were noted in only a few of the many water samples taken, which was in contrast to 1961 when depletion was extensive in July of that year.

Surface water temperatures averaged about 75° F. in the western sector of the

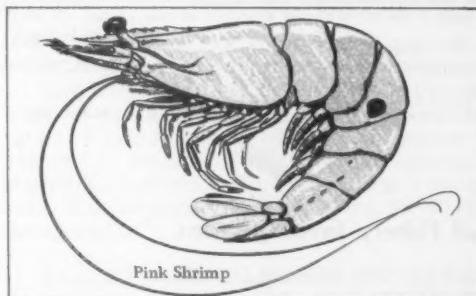
lake and 70° F. in the central and eastern basins, and fluctuated little during the month. Note: See Commercial Fisheries Review, Aug. 1962 p. 21.



Gulf Exploratory Fishery Program

BURROWING BEHAVIOR OF PINK SHRIMP STUDIED:

M/V "George M. Bowers" Cruise 37 (April 19-21 and 26-28, 1962), 38 (May 10-15), 39 (June 12-28): Field experiments on the behavior phase of the shrimp gear research project in the Gulf of Mexico were the objectives of these cruises by the U. S. Bureau of Commercial Fisheries research vessel George M. Bowers. Cruises 37 and 38 were conducted in Mississippi Sound where conditions were unfavorable for behavior studies. Conditions for this work were excellent in St. Andrews Bay, Fla. (Panama City) during cruise 39, and the initial phase of the study was completed there.



Experiments were conducted to determine the burrowing behavior of pink shrimp so as to gain a better understanding of the effect of such behavior on the efficiency of commercial fishing gear. The initial objectives were to measure the extent and duration of bottom penetration by the various commercial species, and the effect of artificial stimulation on the animal while in the burrowed state. Observations were made using SCUBA gear to eliminate all but essential artificial environmental effects.

The following data were obtained from these observations and measurements:

1. The manner by which pink shrimp burrow into the bottom using their various appendages.

2. Burrow depths ranged from $\frac{3}{4}$ to 2 inches.

3. Pink shrimp burrow to just below the surface of the substrate, and are very difficult to detect visually.

4. Mechanical stimulation (probes, chain drags, and water jets) to the dorsal body surface cause the burrowed animal to immediately withdraw deeper into the bottom sediment.

5. Artificially-induced sediment clouds above burrowed shrimp caused about half of the individuals to emerge from the bottom.

6. Observed pink shrimp remained burrowed from $13\frac{1}{2}$ to 23 hours. Activity above the bottom seemed to be restricted.

7. Shrimp generally emerged from the bottom between 7 p.m. and 7:30 p.m. and were burrowed again by 9 p.m. A few individuals would usually remain unburrowed and on the bottom for most of the night.

Shrimp behavior experiments are to be continued through the summer in St. Andrews Bay.

Note: See Commercial Fisheries Review, Jan. 1962 p. 20.



Gulf Fishery Investigations

BETTER SHRIMP CATCHES FORECAST FOR 1962:

A significant upward trend in the shrimp harvest from northern Gulf of Mexico waters during the last half of 1962 is indicated by findings of shrimp studies conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. This prediction is based on an analysis of comparable measures of abundance obtained for young brown shrimp in the Galveston area over the past three years.

Although the brown shrimp reproduces offshore in almost all seasons, the greatest spawning activity takes place during the period late January to early March. The resulting masses of larvae arrive at the barrier island passes and begin to enter inshore "nursery" areas roughly 4 to 5 weeks after spawning and hatching. Some 6 to 7 weeks later they reach a size suitable for sport fishing bait, and soon thereafter migrate

back to the open Gulf where they are normally caught in good quantity by the commercial fishing fleet during July to September.

By means of carefully executed sampling techniques, Bureau biologists measure the size of the brown shrimp's "spring run" at two distinct stages in its early development. The first measure, or index, is obtained as the shrimp pass through Galveston Bay entrance. At that stage they are very densely concentrated, average only about 5/8 of an inch in length, and are called postlarvae. The second index is obtained from statistics of the commercial bait shrimp fishery which operates throughout the Galveston Bay system, one of the more important nursery areas on the upper Gulf coast. Referred to as juveniles or "bait," the shrimp at that stage range from 2 to 4 inches long, but are not so crowded or numerous as when they were sampled at the Bay entrance six weeks earlier. Commercial size is reached at a length of approximately 5 inches and shortly after the shrimp return to the ocean.

Indexes of Abundance for Postlarval, Juvenile, and Adult Brown Shrimp, East Texas Gulf Coast, 1960-1962

Month	Postlarvae 1/		Juveniles 2/		Adults 3/				
	1962	1961	1960	1962	1961	1960	1962	1961	1960
Jan.	27	-	3	-	-	0.3	-	0.33	0.43
Feb.	231	1	2	-	-	0.3	-	0.29	0.38
Mar.	5/306	23	615	-	-	0.2	-	0.21	0.45
April	280	35	554	-	-	0.4	-	0.29	0.23
May	32	25	16	30.4	18.3	29.9	-	0.24	0.31
June	-	-	4/	-	37.1	105.9	-	0.27	0.27
July	-	-	-	-	19.3	27.2	-	0.56	1.43
Aug.	-	16	-	-	11.1	17.4	-	0.48	0.91
Sept.	-	170	3	-	2.1	1.1	-	0.39	0.61
Oct.	-	27	1	-	1.0	3.3	-	0.16	0.49
Nov.	-	3	1	-	1.0	0.9	-	0.09	0.42
Dec.	-	5	1	-	-	-	-	0.15	0.38

1/Average number of postlarvae in "standard," semiweekly samples taken in Galveston Bay entrance; postlarvae range in length from 10-15 millimeters (about 5/8 in.).

2/Average catch of juvenile shrimp (in pounds) per hour's trawling throughout the Galveston Bay system; trawls average about 15 ft. in width and have a mesh of 1-1/2 in.; juvenile shrimp range in length from 40-100 millimeters (1-1/2 - 4 inches); data are obtained from the commercial bait-shrimp fishery which operates continuously.

3/Average catch of commercial-size shrimp (in 1,000 pounds heads-off) per 24 hours' trawling off the Texas coast; adult shrimp range in length from 110-200 millimeters (4-1/2 - 7-1/2 inches; data from offshore commercial fishery.

4/ Sample catches not separated by species during June-August.

5/Includes two samples taken in San Luis Pass at the western end of Galveston Island.

Observations in 1960 and 1961 revealed a very strong correlation between the post-larval and juvenile indexes, and, in each year, the subsequent production of commercial-size shrimp. The possibility that these indexes could be used to economic advantage

in predicting shrimp production during the last half of each calendar year became at once apparent. The fact that the second, or juvenile index, serves to substantiate what is suggested by the first or postlarval index, greatly strengthens the method's usefulness as a prediction device.

In 1960, a high postlarval index in early April was succeeded in May-June by a high juvenile index and record high bait-shrimp production. Both indexes forecast a great abundance of shrimp offshore in late summer. As it turned out, 1960 proved to be a record year for brown shrimp production in western Gulf waters. In 1961, the postlarval index dropped to only a fraction of its 1960 level, while the corresponding juvenile index was reduced by two-thirds. Although the production of bait shrimp in Galveston Bay fell only slightly, bait fishermen had to work up to three times harder to catch the amount needed to meet the demand. The subsequent decline in the 1961 commercial shrimp production offshore, as is now well known, brought dire results to the domestic shrimp fishing industry.

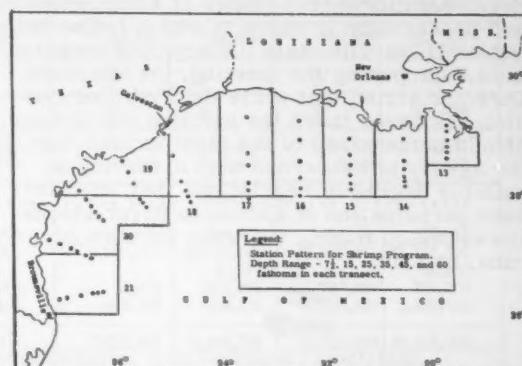
Signs of recovery in 1962 are indicated in a postlarval index for the period February-April which approaches that for the corresponding period in 1960, and by a juvenile index for May of this year which exceeds that of the same month in 1960. Bait shrimp production during May 1962 was also the highest ever recorded for that month. On the basis of these observations, as well as supporting observations made and reported by fishermen and other interested persons, the Bureau predicts good to excellent catches for the shrimp fleet fishing the waters off Louisiana, Texas, and areas off northern Mexico during July-October 1962. Over-all shrimp landings in 1962 should measurably exceed those of 1961, though not necessarily equal those of 1960.

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SHRIMP DISTRIBUTION STUDIES:

M/V "Belle of Texas Cruise BT-23 (July 18-24, 1962): Moderate catches of 12-15 count and 26-30 count brown shrimp were made off the Texas coast by the research vessel Belle of Texas. The vessel is operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries in studying the distribution of shrimp in the Gulf of Mexico.

Four statistical areas were covered. One 3-hour tow was made in each of 3 depth ranges in each area. A 45-foot shrimp trawl was used. Most of the catches consisted of brown shrimp with traces of white and pink shrimp. Large numbers of small brown shrimp counting over 68 to the pound were found at $7\frac{1}{2}$ fathoms in areas 20 and 21.



Shows the station pattern for cruise BT-23 of the M/V Belle of Texas (July 18-24, 1962).

The largest single catch was 50 pounds of over 68 count brown shrimp in the depth range up to 20 fathoms in area 21. The same area yielded 26 pounds of 12-15 count shrimp in the 20-40 fathom depth range, and 8 pounds of less than 12 count shrimp in the 40-60 fathom depth range.

Area 20 yielded 31 pounds of over 68 count brown shrimp in the up to 20 fathom depth range; 10 pounds of 15-20 count shrimp in the 20-40 fathom range; and 7 pounds of 12-15 count shrimp in the 40-60 fathom range.

A catch of 23 pounds of 26-30 count brown shrimp was made in the up to 20 fathom depth range in area 18. Catches were light in other depth ranges in area 18 and in all depth ranges in area 19.

Note: (1) Shrimp catches are heads-on weight; shrimp sizes per pound are heads-off basis.

(2) See Commercial Fisheries Review, Aug. 1962 pp. 22-23.



Indian Fishing

LAW ENFORCEMENT CONFERENCE ON INDIAN FISHING:

Indian fishing activities on the Columbia River was the subject of a law enforcement

conference in Portland, Oreg., on July 20, 1962. Officials of Washington and Oregon, United States Attorneys involved with Columbia River fishing problems, and representatives of the U. S. Bureau of Indian Affairs, and other Federal agencies attended.

The assistant Director of the Oregon Fish Commission said the meeting was called to develop uniform procedures of enforcement and prosecution in cases in which Indian fishing conflicts with State fishery conservation laws. In opening the meeting, the Assistant Director stated that while the Fish Commission has never taken the position that Indians should be deprived of the right to take fish, the agency is concerned with achieving a suitable degree of regulations that will assure perpetuation of Columbia River stocks. Unrestricted fishing will ruin the Columbia runs, he said.



Industrial Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-June 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 6 months of 1962 was 44,933 tons or 21.4 percent greater than during the same period of 1961. Domestic production was 11,873 tons or 11.6 percent higher, and imports were 33,060 tons or 30.7 percent greater than in the 6 months period of 1961. Peru continued to lead other countries with shipments of 106,377 tons during the first 6 months of 1962--32,366 tons above the imports in the same period of 1961.



Bagging menhaden scrap meal in a reduction plant in Empire, La.

U. S. Supply of Fish Meal and Solubles, January-June 1961-62 and Total for 1961			
Item	January-June		Total
	1962	1961	1961
<u>Fish Meal and Scrap:</u>			(Short Tons)....
Domestic production:			
Menhaden	98,588	88,900	247,551
Tuna and mackerel	9,968	9,705	21,243
Herring	826	1,258	5,268
Other	10,043	7,639	37,203
Total production	114,375	102,502	311,265
Imports:			
Canada	23,242	19,367	38,218
Peru	106,377	74,011	151,439
Chile	3,682	5,892	12,074
Angola	-	1,423	1,543
So. Africa Republic	7,184	6,396	13,026
Other Countries	401	727	1,545
Total imports	140,886	107,826	217,345
Available fish meal supply ..	255,261	210,328	529,110
<u>Fish Solubles:</u>			
Domestic production 2/.....	49,277	40,200	112,241
Imports:			
Canada	951	660	1,001
So. Africa Republic	538	307	1,351
Other Countries	2,801	252	4,387
Total imports	4,290	1,219	6,739
Available fish solubles supply ..	53,567	41,419	118,980

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-June 1962 was 12,148 tons more than during the same period in 1961. Solubles and homogenized fish of 49,277 tons manufactured from domestically-caught fish made up 92 percent of the 6-months supply in 1962.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, June 1962: During June 1962, 58,400 tons of fish meal and scrap and 6.9 million gallons of marine animal oils were produced in the United States. Compared with June 1961, this was an increase of 7 percent in meal and scrap production and 4 percent in oil.

In June menhaden accounted for 53,000 tons or 91 percent of the meal total, and

Table 1 - U.S. Production of Fish Meal, Oil, and Solubles, June 1962 with Comparisons

Product	June		Jan.-June		Total
	1/1962	1961	1/1962	1961	1961
(Short Tons)					
Fish Meal and Scrap:					
Herring	640	1,258	826	1,258	5,268
Menhamen 2/	52,994	49,646	93,538	83,900	247,551
Sardine, Pacific	-	-	689	-	2,518
Tuna and mackerel	2/1,837	1,169	9,968	9,705	21,243
Unclassified	2,926	2,326	9,354	7,639	14,757
Total	58,397	54,399	114,375	102,502	291,337
Shellfish, marine animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	21,180	16,110	42,412	36,552	100,551
Homogenized condensed fish	3,170	1,662	6,865	3,648	11,690
(Gallons)					
Oil, body:					
Herring	107,200	185,320	114,200	216,380	818,017
Menhamen 2/	6,572,322	6,231,424	11,073,892	11,047,461	31,355,570
Sardine, Pacific	-	-	19,111	-	86,167
Tuna and mackerel	55,965	43,057	261,383	227,217	762,509
Other (including whale)	176,190	163,682	564,142	374,487	1,386,542
Total oil	6,911,677	6,623,483	12,032,728	11,866,095	34,408,805

1/Preliminary data. 2/Includes a small quantity produced from thread herring. 3/Not available on a monthly basis.

6.6 million gallons or 95 percent of the oil production.

There were 21,200 tons of fish solubles produced in June 1962--5,100 tons above the same month of 1961. The production of homogenized condensed fish amounted to 3,200 tons--about 1,500 tons more than in June 1961.

During the first half of 1962, meal and scrap production amounted to 114,400 tons--

11,900 tons above the same period of 1961. The marine animal oil yield totaled 12 million gallons--a gain of 166,600 gallons.

* * * * *

Production, July 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for July 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, July 1962 (Preliminary) with Comparisons				
Area	Meal	Oil	Solubles	Homog-enized
	Short Tons	1,000 Gallons	.. (Short Tons) ..	
July 1962:				
East & Gulf Coasts ..	55,105	6,191	21,244	3/1,200
West Coast ^{2/}	3,091	292	172	-
Total	58,196	6,483	21,416	1,200
Jan.-July 1962 Total	170,645	17,794	64,903	6,570
Jan.-July 1961 Total	165,937	19,497	56,894	5,895

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes Hawaii, American Samoa, and Puerto Rico.

3/Includes condensed fish.

* * * * *



In menhamen reduction plants large centrifuges are used to separate most of the oil from the press liquor, obtained when the cooked fish are pressed.

Major Indicators for U. S. Supply, July 1962: For the first seven months of 1962, fish meal and solubles production was considerably higher than in the same period of 1961. Fish oil production showed a decrease of 1.5 percent.

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, July 1962						
Item and Period	1962	1961	1960	1959	1958	
Fish Meal:						
Production 1/:			(Short Tons)			
September	-	28,642	36,230	36,874	33,185	
August	-	57,031	49,709	47,364	40,783	
July	58,200	62,586	55,696	52,132	43,467	
Jan.-June	114,375	98,819	74,024	91,473	60,043	
Jan.-Dec. prelim. totals 2/	-	289,039	257,969	275,396	216,510	
Jan.-Dec. final tot.	-	311,265	290,137	306,551	248,140	
Imports:						
September	-	13,941	9,487	9,224	5,079	
August	-	19,026	8,340	5,695	5,310	
July	-	18,710	13,131	4,303	13,546	
June	26,453	19,317	11,178	10,836	9,091	
Jan.-May	114,433	88,509	55,197	90,585	46,855	
Jan.-Dec.	-	217,845	131,561	132,925	100,352	
Fish Solubles:						
Production 3/:			(Short Tons)			
September	-	11,232	12,573	23,979	22,301	
August	-	19,685	16,921	29,785	24,653	
July	22,600	22,589	18,876	30,163	24,985	
Jan.-June	49,277	40,200	36,946	58,888	33,421	
Jan.-Dec. totals	-	112,241	98,929	165,359	130,177	
Imports:						
September	-	263	38	1,732	253	
August	-	318	180	4,718	2,819	
July	-	708	96	4,938	607	
June	872	207	149	202	137	
Jan.-May	3,418	1,012	2,369	8,871	2,156	
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567	
Fish Oils:						
Production:			(1,000 Gallons)			
September	-	3,224	3,939	4,353	3,689	
August	-	6,548	4,910	3,877	4,106	
July	6,500	7,553	5,337	4,143	3,791	
Jan.-June 4/	12,033	11,264	6,877	8,010	5,812	
Jan.-Dec. prelim. totals	-	33,471	26,890	24,418	21,625	
Jan.-Dec. final tot.	-	34,416	27,886	24,978	22,028	
Exports:						
September	-	1,269	1,861	1,129	665	
August	-	1,774	186	2,449	752	
July	-	580	5,414	3,770	791	
June	656	2,805	2,084	1,514	242	
Jan.-May	7,745	6,279	4,959	5,067	4,078	
Jan.-Dec. totals	-	16,331	19,154	19,264	12,539	

1/Do not include crab meat, shrimp and misc. meals.

2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.

3/Includes homogenized fish.

4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.

Note: Data for 1962 and 1961 are preliminary.



Inventions

PRECOOKED FROZEN "LOX AND ONIONS":

A method that will allow smoked salmon, onions, and shortening to be combined and prepared as a precooked frozen food product has been issued a patent. The inventor claims that his new product can be repeatedly thawed and refrozen without loss of flavor, natural juices and taste characteristics, and without change in appearance from a freshly-prepared product. The inventor points out that the housewife thaws what she needs, mixes it with eggs to make an omelet, and returns the remainder to the freezer or refrigerator. By adding cream cheese or other ingredients, the patented recipe may also be used as a sandwich spread or dip. (Patent Number 3,012,896, U. S. Patent Office Classification Number 99-193, granted December 12, 1961, to Moe Phillip Katz, 2085 Farm Road, Alexandria, Va.)



Irradiation Preservation

NEW UNITED STATES ARMY RADIATION RESEARCH LABORATORY:

The first radiation facility specifically designed for food irradiation research was dedicated on June 28 at the Army Quartermaster Research and Engineering Research Center, Natick, Mass. The new U. S. Army Radiation Research Laboratory, the construction of which was completed in June 1962, is the world's largest military installation for the preservation of food by ionizing energy.

The new research laboratory is equipped with the largest known cobalt-60 source in the world (equivalent to more than one million grams of radium), a specially designed 24-million-electron-volt 18-kilowatt variable-linear accelerator, and supporting control and food-sampling preparation laboratories. The laboratory will be concerned primarily with research on radiation of foods for use by the military, but will also conduct studies on different types of foods for civilian use.

By perfecting irradiation techniques, the Army will be able to treat perishable food for storage without refrigeration. Equipment in the laboratory will permit precise control of radiation conditions to a hitherto unattainable high degree of accuracy.

The Army program is currently concentrating on sterilization of beef, pork, smoked ham, and chicken, as meat items of major logistical importance.

By agreement with the Department of Defense, the U. S. Atomic Energy Commission undertook the design and construction of the laboratory at Natick. Following general facility acceptance tests and training of Army operating personnel during the summer of 1962, the Army was to accept responsibility for the fully operational laboratory about September 1, 1962. The Laboratory was built at a cost of about \$1.8 million.



Maine Sardines

CANNED STOCKS, JULY 1, 1962:

Distributors' stocks of canned Maine sardines began to improve on July 1, 1962, after steadily declining for the previous 14 months. But stocks on hand of 134,000 actual cases on July 1, 1962, were still 36 percent below the 208,000 cases on hand on the same date in 1961, according to estimates made by the U. S. Bureau of the Census.



Canners' stocks on July 1, 1962, totaled 374,000 standard cases (100 3 3/4-oz. cans), an increase of 86 percent over the 201,000 cases on hand July 1, 1961. The Maine sardine pack during June 1962 amounted to 407,500 standard cases. Stocks held by canners on June 1, 1962, totaled only 50,000 cases.

The Maine Legislature authorized a 1962 season of 13 months--December 2, 1961-January 1, 1963. The 1962 season pack December 2-July 28 totaled 890,000 standard cases. The 1961 season was from April 15 to December 1, the usual legal packing season for canned sardines in Maine, and the pack April 15-July 28 was 179,000 cases. During the same period in 1960, the pack was 848,000 cases. On April 15, 1962, the date on which the packing season started in former years, carryover stocks amounted to 33,000 cases. One year earlier on April 15, 1961, carryover stocks totaled 457,000 cases.

The Maine Sardine Council in late July reported that fishing was good all along the Maine coast. But the small size of the fish had slowed down production because packing costs go up sharply when small fish are handled.



Marketing

EDIBLE FISHERY PRODUCTS

MARKETING PROSPECTS, FALL 1962:

In the coming fall months, the United States per capita consumption of fishery products is expected to be slightly higher seasonally than during each of the first two quarters of 1962. Commercial landings of food fish and shellfish in August were at the season's peak, and the total for 1962 could be higher than in 1961. Landings of both shrimp and sardines were unusually light in 1961.

Retail prices, which were somewhat higher during the first half of 1962 than in the same period of 1961, are expected to drop slightly during the peak supply season, but will remain higher than a year earlier.

Supplies of fishery products in cold storage at midyear were about 13 percent lower than during the middle part of 1961. But there will be a gradual build-up in stocks of frozen

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, July 1, 1962, With Comparisons^{1/}

Type	Unit	1961/62 Season					1960/61 Season				
		7/1/62	6/1/62	4/1/62	1/1/62	11/1/61	7/1/61	6/1/61	4/1/61	1/1/61	11/1/60
Distributors .	1,000 actual cases	134	99	148	193	202	208	215	267	233	277
Canners . . .	1,000 std. cases ^{2/}	374	50	45	144	221	201	294	506	1,029	1,258

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 3 3/4-oz. cans equal one standard case.



View looking south on South Street in the salt-water section of New York City's Fulton Fish Market.

fishery products and canned fish because of increased fishing and processing in the third quarter.

United States imports of most fishery products through the first half of 1962 were generally greater than a year earlier, and are expected to continue so for the remainder of this year.

Note: Prepared by the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, and published in the Department of Agriculture's July 1962 issue of The National Food Situation (NFS-101).



Massachusetts

MARINE FISHERIES PROMOTION AND DEVELOPMENT LAW ENACTED:

A new Massachusetts marine fisheries law was signed (Chapter 715) by the Governor of Massachusetts on July 23, 1962, and became effective as of that date. The purpose of the new law, which was declared an emergency law, was to immediately bring about the orderly and coordinated activities of the Massachusetts marine fisheries and all activities relating thereto.

The law as amended provides for the following:

1. A Marine Fisheries Advisory Commission composed of 9 members within the Division of Marine Fisheries, such members to be appointed by the Governor with the approval

of the Council. Initially, 3 members of the Commission are to be appointed for terms of 3 years, another 3 members for terms of 2 years, and the other 3 members appointed for terms of 1 year. As the term of a member expires, his successor is to be appointed for a term of 3 years.

2. The Commission shall hold public hearings and make recommendations to the Director for the proper management and development of the marine fisheries of the Commonwealth of Massachusetts.

3. Additional funds for maintaining, managing, operating, and administering the Division of Marine Fisheries in carrying out its functions.

The new law is designed to help both the commercial and sports fisheries of Massachusetts, and is expected to result in expanded activities in the fields of fishery biology and statistics.



Oceanography

"WILLIAMSBURG" AS BIOLOGICAL RESEARCH SHIP FOR INDIAN OCEAN EXPEDITION:

Activation of the former Presidential yacht Williamsburg as a United States biological research vessel for the International Indian Ocean Expedition was announced on July 10. The National Science Foundation today announced award of a contract to the Woods Hole Oceanographic Institution for activation of the vessel.



Fig. 1 - The former presidential yacht Williamsburg is being reactivated as a United States biological research vessel and its name changed to Anton Bruun.



Fig. 2 - The former presidential yacht Williamsburg was transferred to the National Science Foundation of Washington on August 9 in brief ceremonies at the Philadelphia Naval Base.

Amount of the cost-plus-fixed-fee contract is \$500,000. Under the terms of the contract, the Institution will select the shipyard to accomplish the activation, subject to approval by the Foundation, and will supervise the work for the Foundation.

"The International Indian Ocean Expedition is a significant step forward in scientific cooperation," said the Foundation Director in making the announcement. "It represents not only the cooperative efforts of many countries, but cooperation among scientists of widely varying disciplines. Biologists as well as physical scientists will have a major share in the work. We are delighted that the Williamsburg is available as an important addition to their research capabilities."

Title to the ship remains with the United States Government, and she will be operated as a public vessel. Transfer of accountability from the Navy to the National Science Foundation, an independent agency of the Government, is now in process.

The Williamsburg early in July was in reserve status at the Philadelphia Naval Shipyard. She was to be towed to a private shipyard for activation, which is expected to take about 60 days from the date of her arrival in the yard.

Activation will include minor alterations necessary to make a research vessel capable of carrying 26 scientific personnel and 19 crew members. The former Presidential suite will be converted into laboratory areas. A wet lab will be installed below, where specimens will be received, bottled, and prepared for storing. A dry lab above will be equipped with microscopes and other instruments for preliminary examination and classification of specimens, and for such work as measurements of plankton density.

Two winches and a small crane will be installed for dredging and deep-sea work. In addition, a side deck platform will be constructed for fishing long lines.

Activation will also include bringing the engines to full operating condition, and installing larger bilge keels to enhance the ship's stability.

Following activation and a shakedown cruise, the Williamsburg is expected to begin her Indian Ocean cruise in early 1963. Present plans call for the ship to spend most of her two-year research cruise period in the western half of the Indian Ocean, although one track is planned in the Bay of Bengal on the eastern side of the Indian subcontinent. Her voyages will take her from the northern part of the Arabian Sea west of India down to the latitude of the Cape of Good Hope, crossing and recrossing the equator.

While participating in the International Indian Ocean Expedition, she will make port chiefly at Bombay, India, for resupply and to exchange personnel and specimens. Many biological specimens, particularly plankton, will be exchanged and sorted at the International center at Cochin, India.

Among the questions that biologists aboard Williamsburg will be seeking to answer are:

What organisms are found in the Indian Ocean--from microscopic plankton to large fish, oceanic mammals, and sea weeds?

What is the distribution, both seasonal and geographic, of these organisms, and what is their relative abundance?

What is the productivity of these organisms? --particularly organisms which if properly exploited could contribute greatly to the food needs of the peoples of the area.

The President announced on March 13, 1962, that he was making the Williamsburg available for participation in the International Indian Ocean Expedition, and assigned responsibility for conversion and assignment of the ship to the National Science Foundation.

The Williamsburg is 243 feet long and displaces 1,700 tons. Built in 1930 as the Aras, her name was changed during World War II when she became a Navy escort vessel. She was later converted to a Presidential yacht.

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"WILLIAMSBURG" RENAMED "ANTON BRUUN" AND CONVERTED TO A RESEARCH VESSEL:

The former Presidential yacht Williamsburg will be renamed the Anton Bruun, the Director of the National Science Foundation announced on July 30, 1962. The ship was recently transferred to the Foundation for conversion to a research vessel for the International Indian Ocean Expedition.

"Anton Bruun was a noted marine biologist, associated with the University Zoological Museum of Copenhagen, and was first chairman of the International Oceanographic Commission, which is now sponsoring the Indian Ocean expedition," the Director said. "So it is most fitting that the ship be named after him."

The Director made the announcement during a talk at the NATO Advanced Study Institute on Algae and Man, held at the University of Louisville, Kentucky.



Oregon

ALBACORE TUNA STUDIES IN NORTH PACIFIC:

To study albacore tuna movements and to collect oceanographic data affecting tuna

movements off the Oregon coast were the objectives of the June 28-July 8 exploratory cruise by the Sandra Lee, a vessel chartered by the Oregon Fish Commission. The Commission has sponsored an annual exploratory cruise to study tuna for the last four years.

The Sandra Lee followed a zigzag course within an area 40 to 140 miles off the Oregon coast. The initial catch, consisting of 3 albacore tuna, was made at 8:30 a.m. July 5, about 115 miles west of Cape Sebastian. Water temperature in the area of the first catch was 59° F. Water temperature readings in other areas ranged between 58° and 60° F. Many forage fish and numerous birds were seen north of the area of the first catch. No commercial vessels were observed fishing for tuna in the area at the time of the first catch.

Last year the first tuna was caught on July 6, and 15 fish were taken during Oregon's 1961 exploratory tuna cruise.

Note: See Commercial Fisheries Review, August 1961 p. 34.

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CHINOOK SALMON TRUCKED AROUND COUGAR DAM:

The erection of Cougar Dam, a U. S. Army Corps of Engineers' flood control structure, on the South Fork of the McKenzie River in Oregon created a serious upstream passage problem for fish. During construction, the South Fork has been diverted through a tunnel. The diversion is no obstacle for young downstream migrant salmon heading for the ocean. But adult chinook salmon heading upriver are unable to negotiate the fast moving waters in the tunnel.

A temporary fish passage facility, operated by the Corps of Engineers under supervision of the Oregon Fish Commission, has been located just below the dam site to move the important South Fork spring chinook run past the construction area. A cement and steel adaptation of the ancient weir and funnel trap has been built across the stream. The weir shunts the salmon into a cement chamber. A strong current of water leads them next through a funnel entrance into a steel tank. When 20 to 50 fish are in the tank the entrance is closed and the steel tank trap is lifted by crane to a waiting truck. Water-recirculating hoses and an air line

are attached to the tank and the salmon are hauled seven miles upstream to the release site.

The salmon taxi, now in its third season of operation, had moved over a thousand adult salmon from this year's spawning run past the Cougar Dam project by the end of June.

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NEW CRAB-TAGGING METHOD:

The success of the Oregon Fish Commission's new Dungeness crab-tagging program became more apparent as the season advanced, according to the head of shellfish investigations at the Newport Laboratory at Newport. He emphasized that the retention of the tag through several successive sheddings represents a major breakthrough in the study of the migration, distribution, and growth rates of crabs. An insertion point was found along the splitting line of the crab shell which makes retention possible, and paves the way to a much more comprehensive study of crabs. Two types of tags are used in the operation, a nylon spaghetti-type and a plastic dart-type tag. According to the Laboratory chief, more has been learned in the past year regarding growth rate than was determined during several previous seasons of study. The value of tagging efforts in the past was limited by the fact that crabs shed their shells as often as two or more times each year, with the tag being lost at the first shedding.

The Laboratory chief stated that as of July 1962, over 100 recoveries had been made from the 1,000 specimens released last summer with the new tag. More were being reported almost daily. One recovered crab was tagged in July 1961 in the Sally's Bend area of Yaquina Bay and recaptured in June 1962. This crab, when tagged, was of sub-legal size, measuring $4\frac{1}{2}$ inches across the back. It had grown to $6\frac{1}{2}$ inches in width, had shed its shell twice, and regenerated a claw which was missing when tagged.

The Commission's biologist pointed out that the public could render a valuable service in the study of this important food species by reporting tag recoveries. "So far we have received tags from both ocean- and bay-caught crabs," he said, "and recoveries have been made as far from the Yaquina Bay tagging locale as Alsea Bay, some 20 miles

down the coast." If crab fishermen would send in the carapace, or back shell, and the tag, along with details regarding location and date of catch, the information gained would be of great value in the management and development of this important resource. According to the Laboratory chief, occasionally a tag is returned without the back shell, and while these are helpful in the study, the back shells are of very great importance as they are the means of determining growth rate.

Note: See Commercial Fisheries Review, May 1962 p. 25.

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RAZOR CLAM TAGGING STUDIES:

A method of tagging razor clams that will help provide biological facts to guide clam conservation measures has been devised by Oregon Fish Commission biologists. The razor clams are tagged by drilling a small hole through the upper edge of the shell. One end of a monofilament fishing line four feet in length can then be tied to the clam's shell. Color-coded plastic beads are slipped on the line to identify individual clams. A float one-half inch in length is then tied to the other end of the monofilament line and the clam is returned to the beach.

Periodically the tagged clams are dug and examined to determine the rate of growth and the extent of movement from one area of the beach to another. The Oregon Fish Commission has requested sport and commercial clam diggers to avoid removing tagged razor clams from the beach. In most tagging programs, the recovery and reporting of tagged specimens is desired. But tagged razor clams are an exception at present.



Oysters

PROGRESS IN DEVELOPMENT OF CHEMICAL CONTROL METHOD FOR ENEMIES:

Various aspects of a chemical control method for oyster enemies are being studied in Lewis Gut, an arm of Bridgeport Harbor. It is traditionally known as an area where oysters set quite consistently, and where growth of young adult oysters is quite rapid. That area is also known as a "drill hole." During recent years, that oyster-seed-producing section of Long Island Sound has not



Planting of adult clams, *Mercenaria (Venus) mercenaria*, on experimental lots in New Haven Harbor prior to their treatment with different concentrations of drill-controlling chemicals.

been extensively used because of the predatory oyster drills.

Chemical treatment was applied on June 27 and 29, 1962, by biologists of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn. Approximately 30 acres of the bottom were treated using the Laboratory's formula, consisting of a mixture of sand, Polystream and Sevin, at the rate of 5 yards of sand per acre. Biologist-divers examining the bottom of the "Gut" after treatment found that all forms of snails had been affected. This included oyster drills, *Urosalpinx* and *Eupleura*, and conchs, such as *Busycon* and *Polinices*. The *Polinices* is the arch enemy of clams. It kills them by boring holes through the shell near the umbo and then consuming the molluscan meats through the holes. The rest of the clam was affected only slightly, or not at all. The only exception was noted among the worms, which were seen twisting out of their burrows.

It is too early to evaluate all aspects of this experiment on oysters because final conclusions may be drawn only at the end of the season. But it can be stated now, that the chemical treatment reduced the oyster drill population by more than 99 percent.

A method for determination of Polystream in meats of oysters and clams has been successfully developed and has been submitted to the Pesticide Branch, Division of Food, Food and Drug Administration, for approval. Quantities of Polystream of less than 0.05 parts per million in shellfish meats can now be accurately detected.

Using newly-developed analytical methods, preliminary tests of samples, collected from the area receiving twice the maximum dose of treated sand needed to exterminate drills, indicated that although Polystream is present in minute quantities in oyster meats collected soon after treatment of the beds, this residue almost completely disappears within 120 days even though the oysters remain on the chemically-treated bottom. A sample of clam meats, taken 120 days after the bed had been treated, showed no traces of Polystream. The oysters and clams were planted on the experimental beds several days before the chemically-treated sand was spread over them.

As reported earlier concerning use of the insecticide Sevin, the second component of the Laboratory's formula, no traces of it were found in oysters or clams two weeks after the treatment.

Regardless of these promising preliminary results, no final conclusions as to the safety of the method have been formed. That will be possible only after examination of much larger numbers of samples of clam and oyster meats from areas treated in various manners, and after the results of these examinations are studied and accepted by the U. S. Public Health Service and the Food and Drug Administration.

The Milford Laboratory was informed by a marine biologist of the State of Oregon that, by using the Milford Laboratory's formula at the rate of 1,000 pounds of Polystream Sevin-treated sand per acre in their experiments, they achieved near absolute extermination of the mud shrimp, *Upogebia* and *Callianassa*. The experiment demonstrated that two other enemies of oysters may be easily and cheaply controlled at an approximate cost of \$10 per acre. Since some of the shrimp-infested oyster grounds of the Pacific Northwest formerly produced up to 1,000 bushels of oysters a year, the cost of controlling mud shrimp may be only about one cent per bushel, or even less if the treated ground does not become reinfested for several years. (Bulletin No. 2, July 26, 1962.)

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LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING AS OF JULY 26:

Setting of Starfish: The first setting of starfish appeared on the collectors on June 27. They were most common in the Bridgeport area. Starfish setting has continued since

that date, reaching its highest between July 12 and 16 and then decreasing. Thus far, nevertheless, starfish setting has remained heaviest in the Bridgeport area although one station at a 30-foot depth in Milford also showed quite an intensive setting of starfish between July 2 and 12, the U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn., reports.

Setting of Oysters: Systematic studies of the plankton collected at 3 stations have been conducted since the oyster spat collectors were placed in the water in June. Plankton samples from the auxiliary stations, including one station on Lot 152 in New Haven Harbor and 3 stations in Lewis (Bridgeport) Gut, are also collected as a matter of routine. Each sample consists of the plankton contained in 250 gallons of water.

The numbers of bivalve larvae have been unusually light all summer. Oyster larvae first appeared about July 18 at 2 stations. Several days later, on July 23, 25 oyster larvae per 250 gallons of water were recorded at one station; 5 at another station; and 10 at another. All of these were mature, ready-to-set individuals. No oyster larvae of any age were found in samples taken at the Bridgeport Station or in Lewis Gut, where extensive experiments on chemical control of drills are conducted, but copepods, crab, and barnacle larvae, as well as larvae of gastropods and worms, were present in large numbers and appeared normal.

The first setting of oysters occurred on July 18. Thus, once again, the formula for prediction of the beginning of setting, which states that, "setting is normally expected to occur on July 19^{1/4} days," proved to be correct. At first, recently-set oysters were found only at two stations in the New Haven area, but later the setting became of a more general nature, being the most intense at 3 stations. A light setting also occurred in the Milford area, while virtually none took place in Bridgeport.

Because of the presence of mature larvae in plankton samples collected in New Haven and because many oysters on the collectors removed from the water July 23 were only a few hours old, good setting was expected to continue for several more days at 3 stations. If the intensity is maintained at about the same level, or if it increases, the industry may expect a set of commercial importance in that area provided, of course, that it can be protected against predators.

Biologists of Milford Laboratory, using information obtained from studies of plankton samples and other observations, are advising the members of the Connecticut oyster industry as to where shells should be planted to secure the best possible results. For example, they advised against planting shells at the time in the Bridgeport area where no setting was occurring. Instead, it was suggested that advantage be taken of the setting in the New Haven area by planting shells in that location.

In mid-July several auxiliary stations for observations on spawning and setting of oysters and starfish were established. On one of the stations located in New Haven Harbor near Lighthouse Point, studies will be conducted on intensity of oyster and starfish setting on chemically-treated and untreated oyster shells planted as cultch. Five stations were established in Lewis Gut where experiments on extermination of drills by the Laboratory's chemical method are now in progress. (Bulletin No. 2, July 26, 1962.)

* * * * *

MARYLAND OBSERVATIONS ON SPAWNING AND SETTING, JULY 1962:

July of this year was unseasonably dry and cool. This has prevented further strong rises in water temperatures that continued to run around 77° F. locally, a little below seasonal normal, but favorable to oyster spawning. Salinities continued

above normal, according to the "Special Oyster Bulletin" of the Maryland State Chesapeake Biological Laboratory, Solomons.

The combination of long continued summer water temperatures, attained earlier than usual in May, and the above normal salinities resulted in an early build-up of the fungus parasite, *Dermocystidium*, in the southern portions of the Maryland Chesapeake area (from the vicinity of Solomons to Virginia). A number of oysters heavily infected by the parasite were found on trays in St. Marys River, Holland Straits, and at Solomons. There was an accompanying mortality on those trays that is definitely above normal for this season and among some groups quite heavy.

Oysters crowded together on a tray are known to develop a higher degree of infection by *Dermocystidium* than do oysters that are more scattered on the bottom. However, oysters infected by the parasite also are appearing on natural beds in the affected areas. On Cinder Hill in Holland Straits 17 out of 20 living oysters collected on July 19 showed positive *Dermocystidium* infection, mostly light. A number of recent boxes were present on the bar. Gapers from trays and the one gaper (dead oyster) taken from a natural rock were all heavily parasitized by the fungus to the extent that the oyster deaths were almost certainly due to *Dermocystidium*.

High water temperatures and high salinity favor development of the fungus and intensity of infection with subsequent oyster mortality tending to increase in proportion to the length of time that water conditions remain favorable to the parasite. Usually, peak losses occur in late summer. The present conditions indicate that such losses will be higher than usual during 1962. Future seasonal conditions, however, will influence the severity of the expected mortality.

Dermocystidium has shown no tendency to spread among oysters growing in low-salinity water such as usually is found over the extensive oyster-growing grounds above the Solomons area. Moving infected oysters to lower salinity, however, does not kill the parasite and oysters seriously affected by it will continue to die. Oysters on a densely-populated bottom tend to develop a higher degree of infection than do oysters that are more scattered because of the easier transmission of the fungus from one oyster to another. Young oysters generally appear to be immune to the parasite but develop infections during the second year and may undergo heavy losses during the third year in areas where *Dermocystidium* is common.

Sizable losses from the parasite have occurred during other seasons in St. Marys River and in Holland Straits where oyster populations are fairly dense. Also, on several bars in Pocomoke Sound and in upper Tangier Sound oyster losses occurred in the past on bars that were then densely populated but now contain fewer oysters.

Losses can be reduced by not permitting dense populations of oysters to remain in *Dermocystidium* infested areas for more than two years before harvesting them. In portions of the Gulf Coast where this parasite is a very serious pest, it has been found that better oyster crops can be produced when oysters are harvested while young. Furthermore, the more rapid growth of young oysters results in a higher bushel return from two successive crops of young (3^{1/2}) oysters than from a single crop that is left for the same total number of years to produce oysters that are larger but slower-growing and fewer in numbers due to the natural mortality over a longer period.

No increases of infection by the parasite MSX were observed through July this year. The principal oyster mortalities associated with MSX were observed to occur in early summer and again in late summer and early fall with scattered deaths throughout the rest of the year. It is too soon for the late summer losses to be apparent this season. Since MSX infection in Maryland has continued to be quite low and confined to the Tangier-Pocomoke Sound area, it is hoped that it will not be a serious problem in this year's oyster production.

The number of oyster spat attached to clean test shells exposed for one-week periods continued to increase in most areas. A substantial set already had occurred in St. Marys River and along the eastern side of the Bay at Punch Island and Barren Island.

* * * * *

MARYLAND SETTING OBSERVATIONS, JULY 1962:

An increase in oyster setting rates in the Tred Avon River and Broad Creek, Md., compared with last year was apparent, according to a July 26, 1962, report from the Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Oxford, Md. This development was revealed in laboratory counts of oyster spat in bottom collector bags tended on a weekly replacement schedule at 5 stations in the Tred Avon River and 4 stations in Broad Creek. All stations were occupied both years. Setting rates are expressed as the accumulated counts of spat on 20 inner oyster shell faces per bag per week from late June to mid-July, approximately half the expected most active oyster-setting season.

Counts of setting at the Cedar Point station were of some interest because they demonstrated differences in bottom and off-bottom rates. In addition to the regular bottom weekly collector bags at Cedar Point this year, the Laboratory tended weekly bags suspended in 1-foot strata off the bottom to just below the low-water mark.

* * * * *

WEED "STEALS" OYSTERS PLANTED IN OYSTER RIVER:

Deliberate or accidental introduction of a foreign species into oyster coastal waters often upsets the balance of nature and causes unexpected trouble. Some years ago a Japanese species of green marine weed known as Codium fragile appeared in Peconic Bay at the eastern end of Long Island and rapidly spread over the bottoms of planted oysters. In the spring of 1961, several thousand bushels of Peconic Bay oysters, apparently clean of large fouling plants, were planted in Oyster River near Chatham, Mass. Shortly after that Codium was found on shellfish grounds, attached to newly planted stock. Its rapid growth during the following months amazed the oystermen and caused them considerable concern when it became necessary to spend extra time in cleaning the oysters for marketing.

Codium continued its rapid growth in the summer of 1962. Specimens examined at the U. S. Bureau of Commercial Fisheries Woods Hole Laboratory in July 1962 were much heavier and larger than the oysters to which they were attached. The unwanted weeds were nearly 3 feet high. On good sunny days so many gas bubbles were formed at the

blunt, sausage-like tips of the Codium branches, that both oysters and the attached plants floated in the water and were carried away by the tides. Codium has become an "oyster thief." In the past weeds that "steal" oysters were rarely found on shellfish grounds of the American coast.



Pacific Territories

EXPANDED FISHERIES DEVELOPMENT PROGRAM PLANNED:

Programs to increase the fishery economy, said Secretary of the Interior Stewart L. Udall, is one of the priority points of a five-point program to accelerate the development of the Pacific areas (Samoa, Guam, and the Pacific Trust Territory) administered by the United States. The announcement of the five-point program to accelerate social, political, and economic progress in those Pacific areas was made by the Secretary following his return from an inspection tour. The tour included an inspection of fisheries facilities in the areas visited.

Secretary Udall said priority would be given to fisheries development programs which represented the best immediate hope of islanders for economic self-sufficiency. This would include not only development of such facilities as tuna canneries, but the training of natives in long-line fishing, and boat construction and operation. Most of the natives in those areas are skilled only in fishing close to shore, and have neither the knowledge or equipment for deep-sea fishing.

Negotiations have been under way with some of the major fisheries firms which would result in new sources of income for the islanders. A new tuna cannery which will employ about 400 persons, is planned for American Samoa. A tuna cannery in American Samoa operated by a United States firm has been packing tuna for several years.

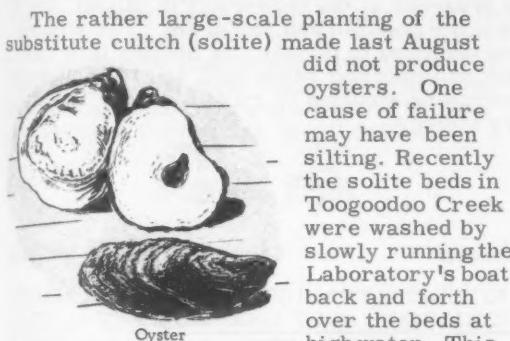


South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, APRIL-JUNE 1962:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for April-June 1962:

Oyster Research: A number of small sub-tidal oyster beds have been located and charted in the last four months off South Carolina. Because these "deep-water" beds are usually quite small, they have little commercial value but, being generally unmolested, the oysters are superior in quality and configuration to intertidal oysters. Experimental planting is being done to try to enlarge several of these sub-tidal oyster beds.



The rather large-scale planting of the substitute cultch (solite) made last August did not produce oysters. One cause of failure may have been silting. Recently the solite beds in Toogoodoo Creek were washed by slowly running the Laboratory's boat back and forth over the beds at high water. This did clear up some silt and left fresh-looking solite exposed. About fifty standard bushels of the solite were dredged, washed, and re-planted in Leadenwah River. To date there has been only a light set on the material. The set is not comparable to that noted on steamed-shell cultch.

Bears Bluff has been cooperating with a Yonges Island canning company in an effort to rehabilitate old oyster beds in Beaufort County in the Fripp Island area. A mechanical raking device was used to dig off the tops of the high old oyster beds in an attempt to soften them, lower the elevation, and expose clean shell which would serve as fresh cultch for a new population of oysters.

Shrimp Research: Experimental plankton tows at regular stations throughout the in-shore area were continued during the second quarter. Results showed that postlarval brown shrimp were more than five times as abundant during the 1962 recruitment period as in 1961. Postlarval brown shrimp entered tidal sounds and rivers for a longer period of time this year and were more consistent in quantity than during either 1961 or 1960. Postlarval white shrimp began to show up in plankton catches in mid-May and became increasingly abundant towards the end quarter. These postlarvae should reach

peak abundance sometime in July, judging from data obtained in previous years.



Otter-trawling at regular shrimp survey stations indicated that spot have been about 30 percent more numerous during the April-June quarter of this year as compared with that of 1961. Croakers showed an increase of over 40 percent during the present quarter as compared with last year's. White shrimp were only slightly more numerous in experimental trawl catches this quarter than in 1961, but brown shrimp showed a considerable increase this year, being almost 60 times as plentiful at regular stations as they were during 1961.

Bears Bluff Laboratory's cast-net records also indicate a great increase in numbers of brown shrimp this year. Over 20 times as many brown shrimp were taken at cast-net stations in May and June of 1962 as in the same period of 1961. This indicates that the commercial catch of brown shrimp should be considerably better than in 1961, and quite possibly the best in the past three years. If white shrimp also have a successful season, a bumper crop of shrimp should result this year.

Pond Cultivation: Two one-acre experimental shrimp ponds were drained and harvested during this quarter. One of the ponds was drained and closed off completely on February 12, 1962. This pond was then stocked by means of pumping water from a nearby creek with an 8-inch irrigation pump. During the period of February 12 to March 30, 1962, approximately $3\frac{1}{2}$ million gallons of water were pumped into this pond. On April 16, the pond was treated with rotenone (3 lbs. per acre foot) to remove predatory fish. On June 25 the pond was drained and harvested. Approximately 19 pounds of brown shrimp were taken and the number of fish harvested was minimal, indicating that the rotenone treatment had been successful.

The other one-acre pond had been drained on February 1, 1962, and screened with $\frac{1}{2}$ -inch wire mesh. The pond flood gates were opened on February 12, 1962, and allowed to remain open until March 30 for natural stocking of postlarval brown shrimp. On April 16, 1962, this pond was also treated with rotenone in order to remove fish. On June 26, 1962, the pond was drained and harvested. Seventeen pounds of brown shrimp were collected. The presence of large numbers of fish in the pond was surprising, and it is felt that a complete kill was not obtained by the rotenone treatment in April.

A similar experiment comparing the pumping method of stocking with the flowing method was made last summer during the season when white shrimp were present. The purpose of this recent experiment was to further evaluate the different methods. In this case, the pumping method was equally as productive as the flowing method. In last year's experiment the natural flowing method was about 2.5 times more effective. However, in that case less water was pumped. The results of the two experiments are really not comparable nor conclusive. They do show that stocking shrimp by means of a pump is possible. However, in both cases the natural flowing method seems to be more feasible when viewed from a cost basis. Pumping is expensive.

Note: See Commercial Fisheries Review, May 1962 p. 29.

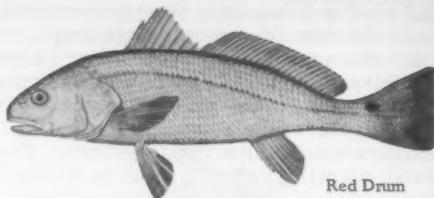


Sport Fishing

TROPICAL PACIFIC GAME FISH SCHOOLING AND FEEDING BEHAVIOR STUDY:

A three-year study of the schooling and feeding behavior of several Pacific game fish was begun in July 1962. The U. S. Bureau of Sport Fisheries and Wildlife has employed a graduate student at the University of California at Los Angeles to make the study. The study will provide information on the roosterfish, scad, grouper, yellowtail, barracuda, and sand bass. Field observations will be conducted in the lower Gulf of California. Underwater observations by camera and tape recorder will be emphasized.

This is the third graduate study supported by the Bureau of Sport Fisheries and Wildlife in its marine program. Two others, now



Red Drum

in progress at the University of Miami, concern the bluefish and red drum. The studies are designed to furnish life history information on important game fish, and to encourage promising students to make a career in fishery biology.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, JULY 1962:

Item and Period	1962	1961	1960	1959	1958
.....(1,000 Lbs, Heads Off).....					
<u>Total Landings, So. At. & Gulf States:</u>					
September	-	9,691	18,832	18,331	15,847
August	-	10,944	20,441	18,595	14,173
July	14,000	10,500	21,797	17,493	13,457
Jan.-June	32,100	31,030	36,775	35,511	36,098
Jan.-Dec.	-	91,395	141,035	130,660	116,552
<u>Quantity canned, Gulf States 1/4</u>					
September	-	785	2,236	2,108	2,825
August	-	1,206	5,041	2,427	2,809
July	3,800	3,042	6,319	3,085	4,805
Jan.-June	8,000	5,405	9,840	10,938	7,109
Jan.-Dec.	-	15,760	28,594	24,679	26,404
<u>Frozen inventories (as of each mo.) 2/</u>					
September 30	-	13,361	26,119	18,079	16,896
August 31	-	12,728	20,171	23,780	15,274
July 31	4/	14,849	17,397	22,357	12,351
June 30	13,796	19,416	15,338	19,283	10,684
May 31	13,904	24,696	17,540	21,137	11,013
January 31	-	31,842	34,332	30,858	17,963
<u>Imports 3/</u>					
September	-	8,190	7,541	7,620	7,471
August	-	6,743	6,407	5,107	6,628
July	4/	6,635	7,319	7,861	6,340
June	9,397	8,065	8,932	8,300	6,018
Jan.-May	54,604	49,103	42,433	41,526	26,260
Jan.-Dec.	-	126,268	113,418	106,555	85,393

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.

2/Raw headless only; excludes breaded, peeled and deveined, etc.

3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/Not available.

△ △ △ △ △ △ △ △ △

Tuna**BLACKFIN TUNA STUDIED TO DETERMINE FEDERAL****SPECIFICATION REQUIREMENTS:**

Six small blackfin tuna from the Gulf of Mexico were canned by the U. S. Bureau of Commercial Fisheries technological laboratory at Pascagoula, Miss., during early summer. The objective was to determine if blackfin tuna from the Gulf would meet Federal specification requirements for canned tuna. The first examination revealed that blackfin tuna should easily meet the U. S. Food and Drug Administration mandatory standard of identity for light meat tuna. The quality of the product was good and also should meet the Federal Purchasing Specifications.

**United States Fisheries****COMMERCIAL FISHERY LANDINGS, JANUARY-JUNE 1962:**

Total Landings: Landings of fish and shellfish in the United States during the first 6 months of 1962 amounted to about 8 million pounds more than during the comparable period of 1961. Production of edible fish was about 35 million pounds less than in the first half of 1961, while landings of nonedible species, principally menhaden, were up 43 million pounds.

Menhaden: During the first 6 months of 1962, landings amounted to 833 million pounds--up 51 million pounds over 1961.

Tuna: Landings in California (including transshipments of United States-caught fish from South America) totaled 151 million pounds to July 14, 1962--down about 24 million pounds compared with the same period in 1961. Purse-seine landings in California dropped 9 million pounds, clipper-fleet landings were down about 10 million pounds, and transshipments declined 5 million pounds.



Fig. 1 - Shrimp trawlers tied up at a dock in Thunderbolt, Ga.

Salmon: On the basis of the reported pack of canned salmon, it was estimated that the Alaska catch to July 15, 1962, totaled almost 80 million pounds--a decline of about 40.5 million pounds or 34 percent compared with the same period of 1961.

Mackerel: At mid-year, 1962 landings of jack mackerel (38.3 million pounds) exceeded those in the previous year by 12 million pounds; while the catch of Pacific mackerel (16 million pounds) declined slightly during the same period.

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1962 and 1961

Species	Period	1/1962	1961	Total 1961
	(1,000 Lbs.).....		
Anchovies, Calif.	6 mos.	1,100	2,074	6,500
Cod:				
Maine	5 mos.	1,100	1,069	2,507
Boston	6 "	12,300	11,309	18,837
Gloucester	6 "	1,700	1,411	3,358
Total cod		15,100	13,789	24,702
Haddock:				
Maine	5 mos.	700	1,114	2,940
Boston	6 "	45,800	45,239	84,093
Gloucester	6 "	9,700	8,320	15,025
Total haddock		56,200	54,673	102,058
Halibut 2/:				
Alaska	6 mos.	14,200	12,530	25,077
Wash. & Oreg.	6 "	7,200	8,693	14,947
Total halibut		21,400	21,223	40,024
Herring:				
Maine	5 mos.	3,800	40	54,463
Alaska	6 "	6,700	15,200	48,600
Industrial Fish, Me., & Mass. 3/	6 mos.	10,800	11,211	41,851
Mackerel:				
Jack	6 mos.	38,300	25,910	98,900
Pacific	6 "	16,100	17,274	30,100
Menhaden	6 mos.	833,300	782,114	2,308,000
Ocean perch:				
Maine	5 mos.	28,000	30,126	77,350
Boston	6 "	300	267	701
Gloucester	6 "	32,300	28,328	53,991
Total ocean perch		60,600	58,721	132,042
Salmon, Alaska	to July 15	79,700	120,200	264,800
Scallops, sea, New Bedford (meats)	6 mos.	10,000	9,744	20,648
Shrimp (heads-on):				
So. Atl. & Gulf	6 mos.	53,100	52,134	153,400
Washington	6 "	600	607	1,459
Squid, Calif.	6 mos.	5,700	882	5,400
Tuna, Calif.	to July 14	151,300	175,460	307,263
Whiting:				
Maine	5 mos.	3	-	14,147
Boston	6 "	70	45	144
Gloucester	6 "	8,300	6,760	51,598
Total whiting		8,373	6,805	65,889
Total all above items		1,372,173	1,369,061	3,715,099
Other 4/		306,327	301,425	1,439,901
Grand Total		1,678,500	1,670,486	5,155,000

1/Preliminary.

2/Dressed weight.

3/Excludes menhaden.

4/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only."



Fig. 2 - Boxes of iced fish on a truck, Weems, Va.

Scallops: New Bedford landings through June 1962 totaled about 10 million pounds--256,000 pounds more than in the previous year. Landings of scallops during 1961 were the largest on record.

Shrimp: Landings in the South Atlantic and Gulf States during the first 6 months of 1962 amounted to 53 million pounds--about 1 million pounds more than in 1961.

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FISH STICKS AND PORTIONS PRODUCTION, APRIL-JUNE 1962:

United States production of fish sticks amounted to 16.1 million pounds and that of fish portions was 18.2 million pounds during the second quarter of 1962, according to preliminary data. This was a gain of 3 percent in fish sticks and 47 percent in portions as compared with the same quarter of 1961. The increase in portions was mainly due to greater production of raw breaded portions (up 4.3 million pounds).

Table 1 - U.S. Production of Fish Sticks by Months and Type, April-June 1962 1/

Month	Cooked	Raw	Total	(1,000 Lbs.)
April	5,028	452	5,480	
May	5,152	457	5,609	
June	4,669	389	5,058	
Total 2nd Qtr. 1962 1/	14,849	1,298	16,147	
Total 2nd Qtr. 1961 .	14,589	1,067	15,656	
Tot. 1st 6 mos. 1962 1/	34,380	2,436	36,816	
Tot. 1st 6 mos. 1961 .	33,722	2,350	36,072	
Tot. Jan.-Dec. 1961 .	65,006	4,813	69,819	

1/Preliminary.

Table 2 - U. S. Production of Fish Sticks by Areas, April-June 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	13,229	22	13,421
Inland & Gulf States .	4	1,892	6	1,232
Pacific Coast States .	7	1,026	10	1,003
Total	34	16,147	38	15,656

1/Preliminary. 2/Revised.

Table 3 - U.S. Production of Fish Sticks by Months, 1958-1962

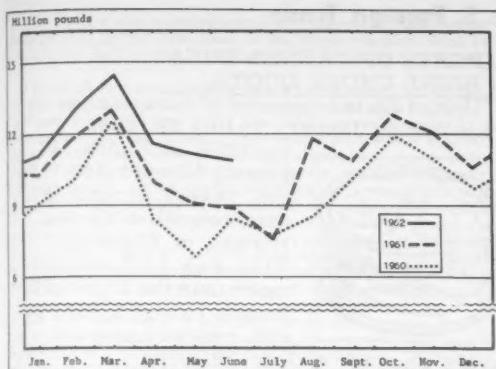
Month	1/1962	2/1961	1960	1959	1958
.....(1,000 Lbs.).....					
January	6,104	6,091	5,511	6,277	5,471
February	6,859	7,092	6,542	6,352	5,925
March	7,706	7,233	7,844	5,604	5,526
April	5,480	5,599	4,871	4,717	4,855
May	5,609	5,129	3,707	4,407	4,229
June	5,058	4,928	4,369	4,583	4,702
July	-	3,585	3,691	3,790	4,574
August	-	6,937	5,013	3,879	4,358
September	-	5,216	5,424	5,353	5,328
October	-	6,143	6,560	5,842	5,485
November	-	6,298	6,281	4,831	5,091
December	-	5,628	5,329	4,743	5,467
Total	-	69,903	65,142	60,378	61,011

1/Preliminary. 2/Revised.

Table 4 - U. S. Production of Fish Portions by Months and Type, April-June 1962 1/

Month	Breaded			Unbreaded	Total
	Cooked	Raw	Total		
.....(1,000 Lbs.).....					
April	1,427	4,773	6,200	149	6,350
May	1,135	4,471	5,606	144	5,749
June	1,043	4,864	5,907	175	6,082
Tot. 2nd Qtr. 1962 1/ ..	3,605	14,108	17,713	468	18,181
Tot. 2nd Qtr. 1961 . . .	2,116	9,835	11,951	451	12,402
Tot. 1st 6 mos. 1962 1/ ..	6,537	29,009	35,546	1,042	36,588
Tot. 1st 6 mos. 1961 . . .	4,888	21,586	26,474	964	27,438
Tot. Jan.-Dec. 1961 . . .	11,003	46,783	57,786	2,061	59,847

1/Preliminary.



U. S. production of fish sticks and portions, 1960-1962.

Table 5 - U. S. Production of Fish Portions by Areas, April-June 1962 and 1961

Area	1/1962		2/1961	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . .	23	9,937	24	6,484
Inland & Gulf States . . .	7	7,623	12	5,488
Pacific Coast States . . .	8	621	6	430
Total	38	18,181	42	12,402

¹/Preliminary.²/Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1962

Month	1/1962	2/1961	1960	1959	1958
January	5,102	4,303	3,632	2,692	1,973
February	6,374	4,902	3,502	3,025	1,254
March	6,931	5,831	4,706	3,225	1,471
April	6,350	4,484	3,492	2,634	2,268
May.	5,749	3,879	3,253	2,684	1,478
June	6,082	4,039	3,995	3,247	1,504
July	-	3,986	4,088	2,227	2,161
August	-	4,987	3,558	2,796	1,516
September	-	5,769	4,631	3,558	1,566
October	-	6,783	5,275	4,314	2,560
November	-	5,813	4,790	3,483	1,979
December	-	5,215	4,459	3,262	2,060
Total	-	60,061	49,381	37,147	21,790

¹/Preliminary. ²/Revised.

Cooked fish sticks made up 92 percent of the fish stick total. The remaining 8 percent consisted of raw fish sticks. A total of 17.7 million pounds of breaded fish portions (of which 14.1 million pounds were raw) and 468,000 pounds of unbreaded portions were processed during the second quarter of 1962.

Plants on the Atlantic Coast produced the bulk of the fish sticks and portions--23.2 million pounds. The remaining 11.1 million pounds of sticks and portions were produced in Gulf, inland, and Pacific Coast plants.

During the first 6 months of 1962, fish stick production of 36.8 million pounds was up 2 percent and the fish portions production of 36.6 million pounds was up 33 percent as compared with the first half of 1961.

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U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED, JULY 1962:

During July 1962, a total of 33 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 50 in July 1961. There were 23 documents cancelled for fishing vessels in July 1962 as compared with 24 in July 1961.

Table 1 - U. S. Fishing Vessels ^{1/}--Documentations Issued and Cancelled, by Areas, July 1962 with Comparisons

Area (Home Port)	July Jan.-July 1962 1961 1962 1961 Total				
(Number).....				
<u>Issued first documents^{2/}:</u>					
New England	5	4	20	21	33
Middle Atlantic	-	1	2	5	12
Chesapeake	2	5	23	41	75
South Atlantic	4	5	21	29	47
Gulf	9	12	62	73	100
Pacific	13	22	100	124	149
Great Lakes	-	1	1	9	12
Puerto Rico	-	-	-	2	2
Total	33	50	229	304	430
<u>Removed from documentation^{3/}:</u>					
New England	1	3	12	11	20
Middle Atlantic	-	1	26	18	34
Chesapeake	5	3	13	21	28
South Atlantic	4	3	22	18	30
Gulf	10	4	69	60	103
Pacific	3	7	72	60	112
Great Lakes	-	3	12	8	14
Hawaii	-	-	3	-	-
Puerto Rico	-	-	1	-	-
Total	23	24	230	196	341

¹/For explanation of footnotes, see table 2.Table 2 - U. S. Fishing Vessels ^{1/}--Documents Issued and Cancelled, by Tonnage Groups, July 1962

Gross Tonnage	Issued ^{2/}	Cancelled ^{3/}
.....(Number).....		
5-9	5	6
10-19	16	8
20-29	3	1
30-39	1	1
40-49	2	1
50-59	-	1
60-69	2	2
70-79	2	-
80-99	-	1
110-119	-	1
120-129	-	1
220-229	1	-
550-559	1	-
Total	33	23

¹/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.²/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 24 in 1962, 2 in 1961, 1 in 1960, 1 in 1951, 5 prior to 1951. Assigned to areas on the basis of their home ports.³/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELLED, JUNE 1962:

During June 1962, a total of 52 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 64 in June 1961. There were 34 documents cancelled for fishing vessels in June 1962 as compared with 26 in June 1961.

Table 1 - U. S. Fishing Vessels 1/—Documentations Issued and Cancelled, by Areas, June 1962 with Comparisons

Area (Home Port)	June		Jan.-June		Total 1961
	1962	1961	1962	1961	
.....(Number).....					
Issued first documents 2/:					
New England	2	2	15	17	33
Middle Atlantic	-	2	2	4	12
Chesapeake	5	11	21	36	75
South Atlantic	4	6	17	24	47
Gulf	15	9	53	61	100
Pacific	25	31	87	102	149
Great Lakes	1	3	1	8	12
Puerto Rico	-	-	-	2	2
Total	52	64	196	254	430
Removed from documentation 3/:					
New England	-	2	11	8	20
Middle Atlantic	2	-	26	17	34
Chesapeake	2	-	8	18	28
South Atlantic	2	3	18	15	30
Gulf	13	12	59	56	103
Pacific	10	9	69	53	112
Great Lakes	4	-	12	5	14
Hawaii	-	-	3	-	-
Puerto Rico	1	-	1	-	-
Total	34	26	207	172	341

1/For explanation of footnotes, see table 2.

Table 2 - U.S. Fishing Vessels 1/-Documents Issued and Cancelled, by Tonnage Groups, June 1962

Gross Tonnage	Issued 2/		Cancelled 3/	
(Number).....			
5-9	2		4	
10-19	24		15	
20-29	5		3	
30-39	6		2	
40-49	1		2	
50-59	3		2	
60-69	-		2	
70-79	8		1	
110-119	1		-	
130-139	1		-	
250-250	-		1	
370-379	-		1	
490-499	1		-	
530-530	-		1	
Total	52		34	

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes redocumented vessels previously removed from records. Vessels issued first documents as fishing craft were built: 38 in 1962, 2 in 1961, 1 in 1953, 8 prior to 1951, and 3 unknown. Assigned to areas on the basis of their home ports.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Sources: Monthly Supplement to Merchant Vessel of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-July 28, 1962, amounted to 32,594,317 pounds (about 1,552,110 std. cases), according to data compiled by the Bureau of Customs. This was 16.8 percent more than the 27,898,898 pounds (about 1,328,519 std. cases) imported during January 1-July 29, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,000 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

* * * * *

FISHERY PRODUCTS IMPORTS FROM U.S.S.R.:

United States imports of fishery products from the U.S.S.R. in 1961 amounted to only 59,000 pounds.

U. S. Fishery Products Imports from U.S.S.R., 1961

Commodity	Quantity		Value
	Pounds	US\$	
Antipasto in oil, canned	362	385	
Fish in oil, n.e.s., canned	12,639	8,027	
Salmon, canned	10,848	8,336	
Crab meat, canned	871	705	
Fish paste, canned	260	133	
Sturgeon roe, salted	32,732	152,862	
Sturgeon roe, boiled in air-tight containers	1,592	23,751	
Total	59,304	194,199	

* * * * *

INSURANCE ON UNITED STATES EXPORTS EXTENDED TO LONGER-TERM POLICIES:

Insurance covering credit and political risks in overseas sales made on terms of up to 5 years is now available to United States exporters. The newly-available medium-term policies can be obtained from the Foreign Credit Insurance Association (FCIA), which operates in cooperation with the Export-Import Bank of Washington.

This is the first time the United States has provided such medium-term assistance for its exporters on an extensive basis, through private business facilities which include ready availability of policy application from insurance agents and brokers.

The FCIA's new coverage was simultaneously announced early in July by the President of the Export-Import Bank in Washington, and by the President of the FCIA in New York.

The FCIA has been issuing short-term export credit insurance (for transactions on terms up to 180 days) since February 5, 1962. Use of the new medium-term policy in conjunction with the existing short-term policy will enable United States exporters to insure against credit and political risks in transactions whose credit terms are anywhere within a 5-year range. In the medium-term policy, exporters will be covered against loss of 85 percent of the financed portion of transactions for both credit and political risks. Credit risks are insolvency of the buyer and protracted default of payment by the buyer; political risks include such government actions as currency convertibility restrictions, export and import restrictions, war, revolution, civil commotion and expropriation.

The new insurance is available on a case-by-case basis. The FCIA will consider applications for a single sale to a foreign buyer or revolving sales to a foreign buyer. Exporters may cover as many or as few of their buyers as they choose during the policy year, since there is no flat "whole-turnover" requirement in the medium-term program. But should an exporter wish to insure on a "whole-turnover" basis, he may do so at a reduced premium and increase the political risk coverage to 90 percent.

As in the short-term policies, a contract form endorsement may be attached to the medium-term policy to extend the coverage during the period of fabrication or manufacture of the product.

Premium rates for the medium-term policy vary according to terms of payment and the buyer's country. Both FCIA and the Export-Import Bank indicate that the premiums and fees for medium-term insurance in the United States compare favorably with those charged by the leading credit insurance systems in other nations. In fact, in some instances, FCIA rates are lower than those charged by foreign insurers.

The FCIA was formed by private insurance companies late in 1961 at the suggestion of the United States Government through the Export-Import Bank. It is an unincorporated association whose membership now numbers 71 companies. Membership is open to all qualified and responsible insurance companies. Both the medium-term export credit insurance policy and the short-term policy are offered to exporters through agents of member companies and general insurance brokers throughout the United States.

Announcement of the FCIA's new medium-term policy rounds out the Association's basic program. The two policies are designed to help United States exporters meet increasing competition from foreign exports who, for the most part, have the benefit of export credit insurance plans abroad.

Two salient benefits will be provided to United States exporters who use FCIA policies.

1. The exporters themselves will be in better position to extend credit to overseas customers, because the substantial portion of risks in the transactions are covered by the insurance.

2. Exporters will be able to obtain financing more readily from commercial banks and other financial institutions when their foreign accounts receivable are so insured.

In addition, commercial banks in the United States should find FCIA policies attractive in connection with the financing of overseas sales, since proceeds of the policies are assignable to banks.



Vessels

FRENCH FISHERY RESEARCH VESSEL VISITS WOODS HOLE, MASS.:

The French fishery research vessel Thalassa docked at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., July 24-26, 1962. The vessel visited the Laboratory prior to a cruise to Georges Bank and northern Atlantic fishing areas. The chief of the vessel's scientific party explained that the purpose of their trip was to investigate stocks of groundfish, especially those which may now be underexploited. The Bureau's Woods Hole scientists had the opportunity to meet the scientists aboard the vessel, learn something of their work, and examine their equipment. Scien-

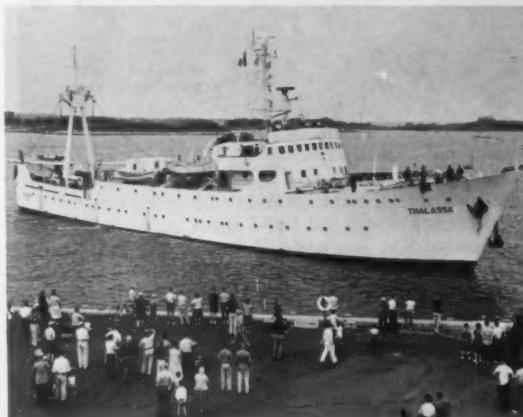


Fig. 1 - French fishery research vessel Thalassa arriving at the U. S. Bureau of Commercial Fisheries dock in Woods Hole, Mass.

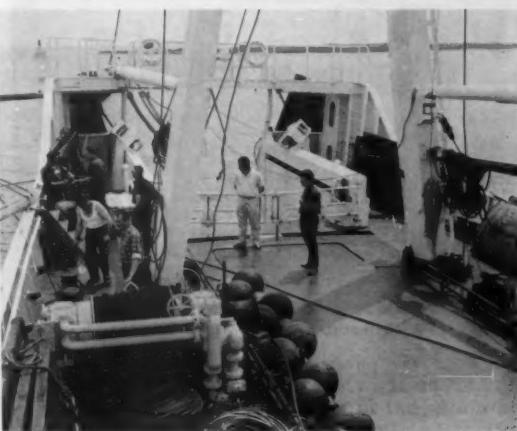


Fig. 2 - Afterdeck of the French vessel Thalassa.

tists on the vessel spent some time ashore conferring with the Bureau's biologists on overlapping studies and problems. A Woods Hole biologist accompanied the vessel on the first leg of her cruise, and he left the vessel at a Nova Scotia port.



Fig. 3 - Tying net to the head rope of an otter trawl aboard the Thalassa.

The vessel arrived direct from her home port (Brest, France). Also, she planned to explore the commercial stocks of ground-fish on the Grand Banks before returning to France some time in September 1962.

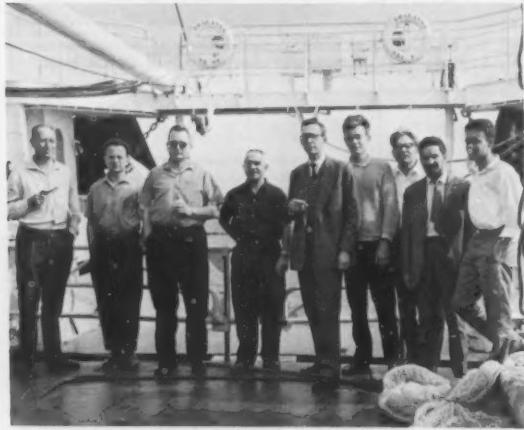


Fig. 4 - Scientists aboard the Thalassa.

A stern trawler with complete biological and chemical facilities, the Thalassa was built at Le Harve in 1960. She is 216 feet

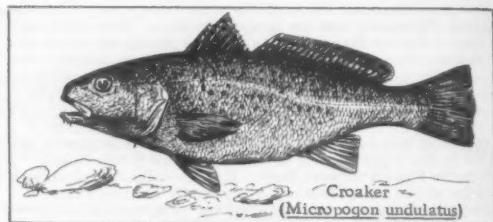
long, 1,481 gross tons and has a maximum range of 12,900 miles. The Thalassa's total complement is a crew of 33 and 22 scientists. On this cruise there were 8 scientists, 2 students, and a visiting Polish fishery biologist aboard.



Virginia

OUTLOOK PROMISING FOR CROAKER POPULATIONS IN CHESAPEAKE BAY SYSTEM:

Improvement in the numbers of croakers inhabiting the Chesapeake Bay system was predicted by marine scientists of the Virginia Institute of Marine Science, Gloucester Point, Va. The prediction made on June 27, 1962, was based on recent winter investigations of the survival of young croakers in up-river areas.



The head of Ichthyology studies at the Institute cited evidence compiled during the past winter indicating a tenfold increase in survival of small croakers over the average of the past five years. He pointed out that these small croakers were spawned in the ocean last fall, and the tiny larvae moved upstream into the brackish-water areas of rivers entering Chesapeake Bay. The supervisor, who is responsible for the Laboratory's young fish sampling program, has been making regular trawl surveys in those upriver areas to determine the abundance of young croakers during fall, winter, and spring indicating the number of fish arriving, and the number which survive the winter.

The Institute's Ichthyology chief and his co-workers agreed that pinheads (6 to 8 inches in size) would begin to appear in increased numbers late in the summer of 1962, and that the commercial fishery and sport fishery will be considerably improved by 1963. Large croakers from the 1962 spawning season will not appear until 1964.

It was also suggested by the Institute's staff that this does not mean an immediate return to population levels of years prior to the severe cold during the winter of 1957/58. They stated it will take several mild winters in succession and the subsequent successful survival of croaker larvae before a return to high population levels can be expected. They hoped the past 1961/62 mild winter was the first of such a series.

Records kept since about 1880 show the commercial catch of croakers in 1961 was the lowest on record. It was believed the predicted increase should result in a significant improvement.

Croakers spawn offshore along the Continental Shelf each fall. After hatching, the larvae move into the Bay and upstream to approach the brackish-water areas of rivers. Those are the nursery grounds of young croakers during their first winter, which is a very critical time of their life cycle. Survivors of the first winter migrate back downstream with the arrival of spring to join regular croaker migrations. By the end of their first summer, they usually grow to pinhead size and reach adult size by the end of their second year. Rarely does a croaker pass an age of 5 or 6 years. Studies by the Institute also show that the annual mortality of croakers is about 70 percent, only 10 percent of which is caused by fishing.

There was some evidence that the extremely cold winter of 1957/58 had a great deal to do with the severe decline of Chesapeake Bay croaker populations over the past few years. The past mild winter, and the subsequent survival in some abundance of croaker spawn, seems to support that evidence.



Washington

CHINOOK SALMON TAGGING:

For a salmon tagging operation off West Beach, Whidbey Island, Wash., Washington State Department of Fisheries biologists used the drum-seine vessel *Sykes*. Tagging began June 17 and continued until mid-August. The purpose was to gain information about migration routes and timing of runs of chinook salmon that pass through the West Beach area. The Department needs the information in order to determine whether



Chinook salmon

to manage the West Beach chinook salmon fishery as a separate fishery, or as part of the chinook fishery in Skagit Bay, Wash.

Salmon were tagged only on Saturday, Sunday, and Monday, when the commercial fleet was not operating. As of June 27, a total of 141 chinook salmon had been tagged, and recoveries had been made at West Beach, Skagit Bay and Skagit River, and Fraser River. The fish averaged about 20 pounds each.

* * * * *

SALMON PLANTED IN KLICKITAT RIVER:

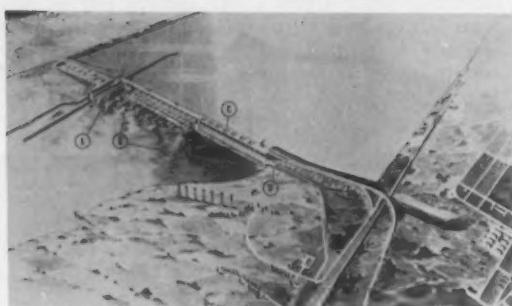
A long-range project to create a run of silver and chinook salmon in the Klickitat River was started in June 1962 by the Washington State Department of Fisheries. Construction of the Castile Falls fishway in 1960 opened up about 30 miles of rich salmon spawning grounds in the upper Klickitat. A plant of 31,300 spring chinook salmon fingerlings was made in the upper Klickitat in August 1961. Additional salmon fingerling plants in the McCormick Meadows area of the river were made on June 21-22, 1962. These consisted of 70,000 large spring chinook salmon from the Wind River; 100,000 silver salmon from the Toutle River; and 50,000 silver salmon from the U. S. Fish and Wildlife Service hatchery at Willard, Wash.

The Washington State Department of Fisheries is carrying out the project with the co-operation of the U. S. Bureau of Indian Affairs, the U. S. Fish and Wildlife Service, and the Yakima Indian tribe. The upper Klickitat is in the Yakima Indian Reservation. The Indian Tribe said they will refrain from fishing in the upper river while runs are established.

* * * * *

SALMON SPAWNING CHANNEL AT MCNARY DAM ON THE COLUMBIA RIVER:

Fall chinook salmon will spawn naturally in a man-made spawning stream, the eggs



Sketch of McNary Dam on the Columbia River showing fishways for the passage of salmon: A, Washington fish ladder; B, entrances; C, powerhouse; D, Oregon fish ladder.

will hatch, and the young fish will grow and migrate. These facts have been learned in the supplemental spawning channel at McNary Dam on the Columbia River, operated since 1957 by the Washington State Department of Fisheries under a contract from the U. S. Army Corps of Engineers. The contract expired on June 30, 1962. The Washington fisheries agency has proposed a one-year renewal of the contract in order to gain more knowledge on this project. The renewal would also produce a maximum number of seaward chinook salmon migrants from the McNary Dam area.

A number of two-year old jack salmon have returned to the channel's discharge stream during the past two years. The Supervisor of Research for Washington State said that the early returns give promise that enough spawners will return to perpetuate the run to the channel. In the fall of 1961, a total of 63 jack salmon returned to the channel from a 1960 release of 55,850 fingerlings which were marked with a right ventral fin clip. The first large group of chinook salmon released from the channel should return in the fall of 1962 as four-year old spawners. The group includes 39,729 salmon from the channel, of which 20,015 were marked, and 100,000 marked Klickitat Hatchery fish released in the channel.

The biologist in charge of the project said the spawning channel has been considerably improved in the light of knowledge and experience gained in the five years of operation. A major addition to the channel in 1961 was the construction of a rearing pond approximately one acre in size. During the 1962 season, the spawning production of salmon

on hatched in the channel will be compared with the young produced at the channel by spawners that were hatched at the Klickitat Hatchery. Live boxes will be used to trap and separate the young produced by each group. When the fish are large enough to handle they will be counted and released into the rearing pond.



Wholesale Prices, July 1962

Stronger market conditions caused by a dip in seasonal landings in New England and a continued good demand for all marine species were responsible for the rise in the July 1962 wholesale price index for edible fishery products to 119.0. From June to July the index rose 0.6 percent, and it was up 14.3 percent from July 1961.

The subgroup index for drawn, dressed, or whole finfish this July rose 7.9 percent from the previous month and was 19.8 percent higher than in July 1961. Compared with June, prices in July were up for all products in this group except Lake Superior whitefish at Chicago. Whitefish prices dropped 13.1 percent from June to July as the supply improved, but they were still 13.1 percent higher than in July 1961. Lake Michigan yellow pike prices at New York City were up 5.6 percent from June to July but dropped 18.1 percent from July 1961. Ex-vessel prices for large haddock at Boston in July were up 65.7 percent from June as a result of lighter landings, and were up 65.2 percent as compared with the same month of 1961. The demand for fresh large haddock was strong because of light landings. From June to July, prices at New York City rose 2.2 percent for fresh western halibut and 1.3 percent for fresh king salmon. Compared with July 1961, prices at New York City this July were 28.5 percent higher for fresh halibut and 12.7 percent higher for fresh king salmon.

From June to July, prices for fresh haddock fillets at Boston were up 23.8 percent despite relatively good landings of small haddock. Fresh shrimp prices at New York City, however, dropped 13.5 percent because of more liberal seasonal supplies from the South Atlantic States. As a result, the processed fresh fish and shellfish index for July dropped 6.0 percent from June, but was up 8.5 percent from July.



View of wholesalers' stand on South Street in the salt-water section of Fulton Fish Market.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes 2/ (1957-59=100)			
			July 1962	June 1962	July 1962	June 1962	May 1962	July 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					119.0	4/118.3	119.4	104.1
Fresh & Frozen Fishery Products:					118.5	4/117.5	118.1	100.4
Drawn, Dressed, or Whole Finfish:					123.3	114.3	119.9	102.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.08	98.6	59.5	65.7	59.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.45	.44	133.0	130.1	122.2	103.5
Salmon, king, lge., & med., drsd., fresh or froz.	New York	lb.	.96	.96	136.2	134.5	139.7	120.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.60	.59	89.5	103.0	106.0	79.1
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.48	.45	77.8	73.7	116.3	95.0
Processed, Fresh (Fish & Shellfish):					113.4	5/120.6	119.7	104.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.39	.32	94.7	76.5	80.1	70.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.90	1.04	105.5	121.9	119.6	84.9
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	134.9
Processed, Frozen (Fish & Shellfish):					113.3	112.7	110.2	90.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.38	98.9	96.3	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.33	98.2	96.7	96.7	96.8
Ocean perch, lge., skins on, 1-lb. pkg.	Boston	lb.	.30	.30	103.4	106.1	110.4	98.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.03	1.03	122.2	122.2	116.8	84.2
Canned Fishery Products:					120.1	120.1	122.1	110.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	28.50	28.50	124.2	124.2	124.2	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.).								
48 cans/cs.	Los Angeles	cs.	12.15	12.15	107.9	107.9	107.9	97.7
Sardines, Calif., tom. pack, No. 1 oval (15 oz.).								
24 cans/cs.	Los Angeles	cs.	5.25	5.25	118.5	118.5	118.5	101.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	11.31	11.31	145.1	145.1	164.3	115.8

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/ Recomputed to be comparable to 1957-59=100 base indexes.

4/ Revisions were minor and did not affect indexes published for June.

5/ Index was unavailable in June.

1961. As compared with the same month in 1961, the subgroup index this July was higher because of substantially higher prices for fresh haddock fillets (up 34.5 percent) and fresh shrimp (up 24.3 percent).

The price index for processed frozen fish and shellfish in July 1962 was up 0.5 percent from the previous month and 25.1 percent higher than a year earlier because of the strong frozen shrimp market at Chicago. Frozen shrimp prices in July remained at the same level as in June, but were up 45.1 percent from July 1961. From June to July prices for frozen flounder fillets rose 2.7 percent and for haddock fillets advanced 1.6 percent, but prices for ocean perch fillets dropped 2.5 percent. Compared with July 1961,

prices this July for ocean perch fillets were up 5.3 percent, and flounder and haddock fillets prices also were up slightly.

Canned fishery products prices were unchanged from June to July but the subgroup index this July was 8.4 percent higher than a year earlier. Compared with July 1961, prices this July were up 1.8 percent for canned pink salmon, up 10.4 percent for canned tuna, up 16.7 percent for California sardines, and up 25.3 percent for Maine sardines. Prices for new-pack Maine sardines remained steady during June-July following the 11.7-percent price drop from May. By the end of July, the canned tuna pack was ahead of the same period last year by 10.8 percent and the canned salmon pack (mostly pinks and chums) was better than expected although still below the 1961 season pack.





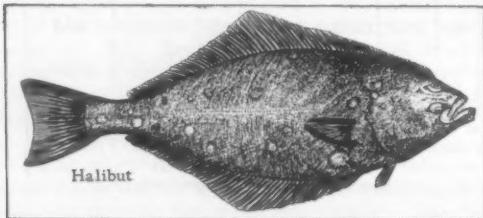
International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT FISHING IN AREA 3A ENDED AUGUST 11, 1962:

Fishing in Pacific halibut Area 3A ended at 6 p.m. (P.S.T.) on August 11, 1962. The International Pacific Halibut Commission estimated that by August 11 the catch limit of 33 million pounds for Area 3A would be reached. As of July 23, 1962, the landings of halibut from Area 3A were 25.5 million pounds, compared with 23.0 million pounds to July 20, 1961. The Area 3A closure this year was about 12 days earlier than in 1961 when fishing ended on August 23 (6 a.m.). In 1960, fishing in Area 3A stopped on July 25, in 1959 on August 1, and in 1958 on August 31.

Area 3A includes the waters off the coast of Alaska between Cape Spencer and Shumagin Islands. Fishing in Area 3A is ended until reopened in 1963.



There has been no announcement as to closure of Area 2 and fishing in that area will continue until the 28.0-million-pound limit has been caught. Halibut landings from Area 2 as of July 23, 1962, totaled 20.0 million pounds, as compared with 21.4 million pounds to July 20, 1961. In 1961, Area 2 closed on September 7; in 1960, Area 2 closed on July 31; and in 1959, Area 2 closed on July 8. The Area 1 fishing season, with no catch limit, will end at the same time as that in Area 2. In 1961 when Area 1 consisted of two areas, that part designated Area 1A was open to fishing to October 1.

The official opening date for all halibut fishing in the North Pacific regulatory areas this year was May 9 (at 6 p.m.) in all areas (Areas 1, 2, and 3A) except in the Bering Sea (Area 3B North) where fishing started on March 28 and in waters west of the Shumagin Islands (Area 3B South) where fishing started on April 19. In Area 3B North fishing will end October 15, and in Area 3B South fishing will end September 30; there is no catch limit for either area.

This year, Area 3A was open to fishing for 94 days--11 days less than the 105 days in 1961. In 1960, the area was open to fishing for 85 days, in 1959 for 92 days, in 1958 for 118 days, and in 1957 for 144 days (the longest season for the area since 1945 when the area was open to fishing for 147 days). Between 1945 and 1955 the trend had been towards a shorter season, but then the trend reversed itself and through 1957 the seasons were longer. Beginning in 1958 the trend was reversed again and the seasons through 1960 became shorter. But the season was longer by 20 days in 1961, and the trend was reversed again with the shorter season this year.

Note: See *Commercial Fisheries Review*, April 1962 p. 37.

FOOD AND AGRICULTURE ORGANIZATION

PROPOSED AGENDA FOR FISHING GEAR CONGRESS IN 1963:

The Second International Fishing Gear Congress under the auspices of the Food and Agriculture Organization (FAO) is to be held at London, England, May 25-31, 1963.

The First draft of the Proposed Agenda follows:

The Second Congress will be organized along lines similar to those of the First Gear Congress in 1957. The 1957 agenda was comprehensive, but it is proposed to limit the 1963 meeting to a few selected topics of maximum interest. Fewer topics will mean more time for discussion of each topic, and strict selection of topics should mean more intense and specific discussion. The main emphasis will again be on recent developments in the industry and on the growth of gear technology.

This first draft of the tentative agenda is designed as a basis for discussion with contacts in industry, research, and government. The Fisheries Division of FAO will appreciate any comments on this draft. Suggestions are needed for deleting or adding items, change of emphasis, etc. Comments are also invited on organizational aspects, duration of the Congress, etc. Tentatively it is envisaged that the Congress would last one working week, Monday through Saturday, with 5 days devoted to discussions and 1 day for an excursion.

I. New Materials and Their Application to Fishing: New synthetic fibers have been developed since the 1957 Congress or have found recent application in fisheries, particularly polyethylene fibers and their admixtures. Other fibers, such as polypropylene, are in an advanced stage of development. These are expected to find commercial application in fisheries in the very near future, possibly before the next Congress is held. Such fibers are expected to have considerable impact, if advance information as to strength weight, and price holds true.

There should be no need to repeat from the First Congress the systematic coverage of

International (Contd.):

characteristics of various net materials and preservation of gear.

Numbering systems for twines might usefully be reviewed again. The Working Group appointed at the First Gear Congress has now prepared a report with recommendations on standardization of numbering systems for netting twines.

Testing methods for gear materials also need to be discussed again. The Working Group appointed at the First Congress has now prepared a report on the various testing methods used in different parts of the world. It is hoped that agreement may be reached on standardization so that test results will be comparable.

Knotless nets were virtually unknown outside Japan four years ago when the First Gear Congress met. Now these nets are finding considerable application in other parts of the world. It might be opportune to discuss and compare the different makes and report on their application in various types of nets (trawls, purse seines, gill nets).

Lines and ropes of novel construction and unconventional materials are appearing on the market. They might perhaps be included on the agenda as a minor item.

Monofilament nets are finding a wider application, even in marine fisheries. It might be useful to discuss their construction and applicability to certain fishing conditions, catchability, etc.

II. Handling of Gear: Stern trawling is still a controversial subject. Until now discussion has been mainly confined to stern trawling with large vessels. The application of this method on smaller craft is also of interest, particularly in view of simpler maneuvering, and the possible saving of labor. Several different stern hauling arrangements are in use. It should be fruitful to discuss the comparative virtues of the various systems under different fishing conditions, with heavy or light gear from different types and sizes of vessels.

Mechanical handling of gill nets and long lines was dealt with rather sketchily at the First Congress. These basic fishing methods continue to be important and in some cases, their importance is increasing. It might be useful to discuss power hauling of bottom-set and drifting nets and lines with various

types of winches and gurdies, grooved sheaves on horizontal axis, either suspended (power block) or fitted on a rigid support. There might also be discussion of deck layouts and for facilitating rapid setting, etc.

III. Gear and Fishing: Certain important gear types, which were passed over lightly at the First Congress, could be discussed under this heading.

Gill nets and tangle nets. Design; methods of framing; effect of hanging-ratio on catchability and selectivity; color; strength in relation to fishing ability, first cost, durability.

Long lines (both bottom-set and drifting) can usefully be described and discussed, particularly the types adapted for mechanized fishing.

IV. Trawling: One-boat midwater trawling is an interesting subject. Many of the people concerned with developing this method feel they are on the threshold of a major breakthrough. However, each developer still seems to have his own special problem. Some have difficulties with depth regulation; some have overcome this problem and have encountered new problems. It would certainly be useful to assemble these persons in one room to solve each others' problems. Quite possibly, the various solutions have already been found in different parts of the world. This forum would help to bring these possible solutions into the open and to the attention of those who need them. Discussions on midwater trawling might come under the following headings: (1) Gear--design and materials of net, floats, kites, boards, warps. (2) Deck gear. (3) Performance--opening size and shape, resistance, maneuverability. (4) Operation (technique)--fish finding, aiming gear (headline transducer, towed "shark," telemeter, etc.), towing speed. (5) Fish Behavior--in relation to gear used. (6) Bottom trawling and off-bottom trawling.

High-opening trawls are of growing interest for catching some pelagic species within a few yards of the bottom. Features of such nets are not known in many parts of the world where they might quite likely find application.

Low and wide-opening trawls--species selectivity of some nets of very low opening may, for instance, be of interest from both the conservation and commercial angles. This may be of growing importance with increasing regulation of fishing in territorial waters.

International (Contd.):

V. Fish Finder With Purse Seines: In recent years a technique has been developed not only for detecting pelagic fish with a fish finder, but also relying on the fish finder indications for guidance in setting one-boat purse seines around the submerged school. This, coupled with the use of extra-deep purse seines, made of strong synthetics and hauled mechanically, has opened up new fisheries. The technique may have far-reaching implications. It seems an effective method of catching schooling fish at considerable depth and under more difficult weather and sea conditions than has previously been feasible with seines. Purse-seining accounts for one-third of the total world catch. Its effectiveness for quantity fishing at low unit cost is unsurpassed. Possible new applications of purse-seining are certainly worthy of careful consideration.

VI. New Ideas: The following items give an indication of some of the subjects that might come up for discussion under this topic: (1) air-bubble curtain fishing; (2) pump fishing (any new developments); (3) acoustical attraction and detection of fish; (4) chemical attractants (artificial bait) and repellants (any new developments); (5) electrical fishing; (6) light attraction with new or conventional gear; (7) fleet operation on distant grounds, including transfer of catch at sea.

Contributions to be presented at the Second Congress are being prepared by fisheries scientists and technologists from many countries. The meeting will be open not only to persons connected with official fisheries services and institutions, but also to interested persons from private industry, and all participants will be free to take part in the discussions. It is expected that copies of papers to be given at the Congress will be distributed in advance of the meeting, so that participants may be prepared to contribute to the discussions, and to the exchange of information and experience. (Regional Fisheries Attaché, United States Embassy, Copenhagen, October 6, 1961; Food and Agriculture Organization, Rome.)

GREAT LAKES FISHERY COMMISSION**ANNUAL MEETING:**

The Annual Meeting of the Great Lakes Fishery Commission was held at Ann Arbor, Mich., June 19-20, 1962. The Commission's

meeting was preceded by a meeting of the United States Advisors on June 18. The highlights of the Commission's Annual Meeting were:

1. Reports on sea lamprey reductions in Lake Superior were very encouraging. The take of migrant adult lampreys in 1962 at 29 index barriers amounted to only 13 percent of the number taken in 1961. The population of larval lampreys in streams has been greatly reduced.

2. Lake trout populations in Lake Superior in 1962 continue to show better than 80-percent reduction in occurrence of lamprey wounds. The lake trout caught were larger by 0.3 to 0.8 pounds. Stocks of young lake trout are dominated by planted and marked individuals. Natural recruitment to the stocks is very low as was expected, but survival of larger fish has improved. There has been little or no recruitment for several years. The ban against lake trout fishing in Lake Superior is being effected with only nominal objections from the Great Lake's fishery industry.

3. The Commission was encouraged by the reports of its agents but, due to stringent needs for economy, adopted a budget and program for fiscal year 1964 only modestly above that of the 1963 fiscal year base. Some control work will be done in Lake Michigan but none is scheduled for Lake Huron.

4. Dr. A.L. Pritchard of Ottawa, Canada, was selected as Chairman of the Commission, replacing Claude Ver Duin of the United States Section. Director Donald L. McKernan was named Vice-Chairman. Lester P. Voigt was chosen as Chairman of the United States Section.

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CHEMICAL TREATMENT OF LAKE SUPERIOR STREAMS REDUCES SEA LAMPREY POPULATION:

Sea lamprey catches at Lake Superior barriers were down substantially, the Great Lakes Fishery Commission reported on June 1962, at the University of Michigan, Ann Arbor, Mich. The Commission, which is a United States-Canadian body heading the fight against a predator that has nearly wiped out lake trout populations in the upper Great Lakes, opened its two-day annual meeting with some hopeful statistics.

International (Contd.):

The Commission's chairman reported that with possibly three-quarters of the sea lamprey spawning run over in the United States, and about half over in Canada, the United States catch at assessment barriers was then 6,191 sea lampreys compared to 51,628 in 1961, and that the Canadian catch was 454 compared with 1,555 at the same time the previous year.

The over-all 1962 sea lamprey catch was about 12 percent of the 1961 catch at the same point—an indication that chemical treatment of Lake Superior streams, which was begun in 1958, was beginning to reduce the predator population.

"We can be justifiably pleased and encouraged by these results," the Commission chairman said, "but I must point out that we still must determine whether or not the lampreys have been reduced sufficiently to allow a recovery of the lake trout and re-establishment of that fishery."

"I suggest, therefore, that the Commission, while acknowledging this major accomplishment of its agents, recognize that total success of the control program depends upon the rehabilitation of the lake trout population in Lake Superior. In the meantime, all reasonable measures must be taken to insure that lampreys are reduced further and maintained at a low level."

In line with that goal, the Commission ordered immediate treatment with lampricide of 2 new Lake Superior streams where lamprey populations were reported, and recommended treatment of 6 minor streams with newly-established populations by 1962-63. There are a total of 86 lamprey-producing streams in Lake Superior.

Response to a Commission request that the various Great Lakes States and Province of Ontario limit lake trout fishing in Lake Superior to operations which will provide essential biological information has been "very encouraging," the chairman added.

Agencies studying the fishery reported a decrease in the occurrence of lamprey scars on fish, and an increase in the average size of lake trout caught, both of which are encouraging signs. "Lamprey predations tend to keep down the average fish size by elimi-

nating larger lake trout from the population," the chairman of a special committee on lake trout rehabilitation said. "Recently there has been, for the first time, a significant increase in the size of lake trout taken, suggesting that more trout are being left to grow. Agencies in the United States studying the lake trout fishery also observed a decrease in sea lamprey wounds on lake trout this spring compared to last year," he added.

The latest evidence indicated that natural reproduction of lake trout in Lake Superior has been negligible in recent years, and that the lake trout population is approaching complete dependence on hatchery-raised lake trout. Hatchery fish made up 94 percent of the total 1961 catch of undersized fish by the U.S. Bureau of Commercial Fisheries research vessel Siscowet.

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CONTRACT-FISHERMEN ONLY TO FISH LAKE TROUT IN LAKE SUPERIOR:

A recommendation that commercial landings of lake trout in Lake Superior be restricted to the amount needed for assessment studies by the various research agencies working on the lake, was made by the Great Lakes Fishery Commission at the interim meeting in November 1961. This recommendation was based on evidence presented by the U.S. Bureau of Commercial Fisheries, the Michigan Department of Conservation, the Wisconsin Conservation Department, and the Fisheries Research Board of Canada. The high percentage of hatchery-reared fish (as high as 95 percent in some areas) among the undersize lake trout in the commercial catch supported earlier evidence that natural reproduction has been practically nil for the past few years, and that the fishery faced almost certain collapse. In view of that evidence, and evidence of markedly lower incidence of sea lamprey wounds during the past year, the Commission felt immediate action was necessary in order to expedite the restoration of the lake trout population. Examination of catches made in the spring of 1962 confirmed the scarcity of small trout, and the lower incidence of lamprey wounds. The Michigan Conservation Commission issued the order in April, to close all commercial fishing for lake trout, except for eight fishermen who are under contract to the U.S. Bureau of Commercial Fisheries to provide research information on their restricted catches of lake trout.

International (Contd.):

The eight commercial fishermen contracted by the Bureau are under specific controls to provide minimal numbers of lake trout required to continuously evaluate the status of the lake trout population in Lake Superior. The restricted commercial fishing will yield: (1) information on the incidence of sea lamprey scars and wounds; (2) length, sex, and age composition of fish caught; (3) numbers of planted fish caught; and (4) the catch per unit of effort (10,000 feet of gill net) in standard commercial gear. These data will be compared with similar records taken by the same eight fishermen in previous years to evaluate the current status of the population and the success of hatchery plantings.

The contract-fishermen will fish only during the months for which comparable data are available from previous years. The total catch of lake trout in Michigan waters will be limited to 25,000 pounds during the balance of 1962. Amounts needed for research purposes in future years will be determined by administrative and research agencies concerned with Lake Superior.

After collection of data for the U.S. Bureau of Commercial Fisheries, the contractor may keep or sell all lake trout of legal size which he has caught. All live lake trout of illegal size shall be returned to the water at the time of capture. Dead, undersize fish shall be surrendered to a conservation officer who will be charged with turning them over to an institution for use in feeding inmates.

Contract fishing will be closed during the October-November lake trout spawning season.

Commercial fishermen who are scheduled to fish for lake trout for the assessment studies are: Tom Brown, Whitefish Point; Falk Brothers, Skanee; Robert Kaliainen, Chassell; Arthur Kolehmainen, Chassell; Arthur Lasanen and Son, Lake Linden; Francis Thill, Marquette; William Tornovich, Grand Marais; and Jerome Van Landschoot, Munising.

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LAKE TROUT CATCHES IN LAKE SUPERIOR RESTRICTED TO QUOTAS:

Because of the rapid decline in lake trout stocks in Lake Superior due to sea lamprey

depredations, Canada and the United States have agreed to restrict the 1962 commercial lake trout catch to only the amount needed by scientists of each country for their studies. The restriction was recommended by the Great Lakes Fishery Commission made up of representatives from both countries.

In a letter to Lake Superior commercial fishermen, the Ontario Lands and Forests Minister said: "It is apparent that, due to the seriousness of the situation, we can only agree. As a result, catch quotas for 1962 have been set at 60,000 pounds from United States waters and 44,000 pounds from Canadian waters."

The steady decline in the lake trout fishery in Lake Superior due to the sea lamprey is indicated in Canada's Lake Superior lake trout landings data for the past ten years. From 1,389,000 pounds in 1952, landings dropped to 1,371,000 pounds in 1953, 1,266,000 pounds in 1954, 1,003,000 pounds in 1955, 527,000 pounds in 1956, 324,000 pounds in 1957, 366,000 pounds in 1958, 238,000 pounds in 1959, and 122,000 pounds in 1960. In 1961, Canada's Lake Superior lake trout landings were estimated to be down to only 44,000 pounds. In United States waters, the decline was from 2,838,000 pounds in 1952 to an estimated 298,000 pounds in 1961.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS**THIRD ANNUAL CONFERENCE:**

The Third Annual Conference of the International Association of Fish Meal Manufacturers will be held at the Mayfair Hotel, London, England, October 9-12, 1962. The Conference will be longer than the two previous conferences. Members of the Scientific Committee will have a full day's pre-meeting discussion on the many scientific and technical subjects which concern the Association. It will also allow the meeting to consider the increasing number of topics in which the Association is actively interested. A special session is to be held for delegates, including leading world industry manufacturers and scientists, to discuss problems of mutual interest with brokers, agents, and importers principally dealing with fish meal.

The Conference will be hosted by the United Kingdom Association of Fish Meal Manufacturers which had a leading role in sponsoring and organizing international fish meal conferences before the formation of the International Association, and in the formation of the United Kingdom Association.

International (Contd.):

The International Associations' main aim and activity is devoted towards cooperation, thereby assisting world fish meal manufacturers to open and develop wider outlets for fish meal in all its forms in both developed and underdeveloped markets, thus enabling this valuable product to play an even greater part in animal and human nutrition.

To this end, manufacturers and scientists connected with the industry undertake a full exchange of information by means of meetings. In 1961 such meetings were held in Hamburg, Bergen, and Paris; also by issuance of a News Summary, and in other ways to improve methods of manufacture and preservation of meal, quality standards, methods of analysis, knowledge of nutritional requirements, and to supply the answers to many other technical and nutritional problems. During the year, a brochure on the use of fish meal was prepared in English, French, and Spanish, which can be used with appropriate additional chapters adapted to local conditions to make its value known in less highly-developed agricultural countries, or in developed countries which now use comparatively little fish meal. Collaborative feeding trials were recently made simultaneously in several countries, and the results were pooled for the common benefit of the industry.

The Association has been actively collaborating and exchanging information with an increasing number of international organizations in connection with statistical information on fish meal, fish flour for human consumption, and with an expert committee of the European Economic Community (EEC) on the question of analytical methods, and similar problems. The Association also cooperates closely with the Fish Meal Exporters Association in FEO's activities relating to establishment of wider markets, exchange of statistics, and similar matters concerned with the promotion of fish meal. All those and other problems will receive detailed scientific and commercial consideration at the Third Annual Conference.

Members of the Association are the manufacturers' associations or individual manufacturers in Belgium, Canada, Denmark, France, Germany, Holland, Iceland, Morocco, Norway, Peru, Portugal (including the Overseas Province of Angola), Spain, South Africa, Sweden, United States, and United Kingdom.

Observers have been invited to attend the Conference from Japan and Chile, the remaining major producers who are not yet members, as well as from the Food and Agriculture Organization (FAO) and the Bureau of Commercial Fisheries, U.S. Department of the Interior.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT**SUBSIDIES AND PROGRAM FOR 1963
DISCUSSED BY FISHERIES COMMITTEE:**

The fourth session of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD), held in Paris, France, on July 9-10, 1962, was attended by nearly all of the 20 member countries and by representatives of the Food and Agriculture Organization (FAO), and the European Economic Community (Common Market).

The principal topics for discussion on the agenda of the meeting were: (1) a review of papers on the fishery subsidies provided by the various OECD countries, and (2) the operational program and budget for the calendar year 1963. Subsidy reports for seven member countries were reviewed, modified, and approved. When the reports on all countries have been cleared, they will be combined to form a complete documentation on the subsidies to fisheries in the OECD countries. The Committee also reviewed the progress in the draft report on the market for canned fish in OECD countries, which is scheduled for completion in the near future.

The projects proposed for the calendar year 1963 include the following:

1. Promotion of uniform quality standards for frozen fish.
2. Study of the establishment of a fishery market newstype service in the European countries.
3. Simplification and coordination of sanitary regulations affecting international trade.
4. Economic factors concerned with the rational exploitation of maritime resources.
5. Detailed nomenclature of the different species and varieties of sea products.

The next meeting of the OECD Fisheries Committee is tentatively scheduled for the first part of October 1962.

Note: See Commercial Fisheries Review, August 1962 p. 55.

International (Contd.):

UNESCO INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSION

ARABIAN SEA PLANS OF INDIAN OCEAN EXPEDITION COORDINATED:

A working meeting on the coordination of operating plans for the Arabian Sea phase of the UNESCO Indian Ocean oceanographic expedition was held in Wormley, England, July 9-11, 1962. The meeting was attended by a group of United States representatives headed by John Lyman, Associate Program Director for Earth Sciences (Oceanography), National Science Foundation, Washington, D.C. The Foundation has been named by the President as coordinator for the United States Government participation in the Expedition.

At its first session (October 1961), the UNESCO Intergovernmental Oceanographic Commission adopted a resolution which commended the International Indian Ocean Expedition to its members for possible participation, and instructed the Secretary of the Commission to assume such coordinating functions as could be worked out with the Scientific Committee on Oceanic Research (SCOR) and other appropriate bodies. SCOR in April 1962 transferred formal responsibility and authority for coordination of the Expedition to the Secretary of the Commission.

The working meeting concerned itself with the coordination of scientific programs involving oceanographic study of the Arabian Sea.

The agenda, as approved by the Meeting follows:

1. Work already done and its results.
2. Existing cruise plans for the Arabian Sea.
3. Coordinating requirements for synoptic work:
 - (a) Time and space adjustment of cruise tracks;
 - (b) Coordination of volume, nature, and methods of measurements to be done;
 - (c) Standardization and intercalibration requirements;
 - (d) Reference stations;
 - (e) Use of underwater cables and buoys.
4. Meteorological problems.

5. Tide gauges.

6. Logistics, e.g. port facilities, explosives, communications, exchange of data, and people, etc.

Besides those from the United States, the Working Meeting was attended by participants from France, German Federal Republic, India, Pakistan, South Africa Republic, United Kingdom, and UNESCO's Intergovernmental Oceanographic Commission.

At the beginning of the meeting it was decided to enlarge the area to be covered by the discussion from the originally planned Arabian Sea region to the whole North-Western Indian Ocean including the Arabian Sea and the part of the open ocean south of it to 10° S. latitude. It was done with understanding of the importance of interregional coordination and of the necessity of some geographical overlap between the regions to be covered by all four coordinating working groups. Some of the water movements and other physical and biological processes must be followed from one region to the other.

Note: See Commercial Fisheries Review, July 1962 p. 51, June 1962 p. 46.

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WORKING GROUPS ON COMMUNICATIONS AND FIXED STATIONS MEET IN PARIS:

Two Working Groups of the UNESCO Intergovernmental Oceanographic Commission, one on Communications, and the other on Fixed Stations met in Paris, France, August 6-10, 1962. The two Working Groups studied various matters relating to communications and fixed stations, particularly the establishment of oceanographic communication requirements, and the legal status of manned and unmanned buoys.

The United States was a prime force in the establishment of the Intergovernmental Oceanographic Commission and has considerable interest in the work being done by the two groups which met for the first time.

The meetings of both Working Groups were attended by United States representatives; the meeting on Communications by a representative from the Scripps Institute of Oceanography, La Jolla, Calif., and on Fixed Stations by a representative of the Woods Hole Oceanographic Institute, Woods Hole, Mass., and an adviser from the Weather Bureau, Marine Observation Section, U.S. Department of Commerce.

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International (Contd.):

GROUP OF EXPERTS ON OCEANOGRAPHIC DATA EXCHANGE MEETS IN WASHINGTON:

A Group of Experts on Oceanographic Data Exchange, UNESCO Intergovernmental Oceanographic Commission, met in Washington, D.C., August 7-10, 1962. The meeting was held at the National Oceanographic Data Center and concerned the organization of data exchanges.

The Oceanographic Commission recommended the establishment of this Group at its first session held in October 1961.

United States members of the Group attending the meeting were from the National Oceanographic Data Center, the U.S. Bureau of Commercial Fisheries, and Coast and Geodetic Survey, U.S. Department of Commerce.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSIONSCIENTIFIC COMMITTEE MEETS IN HONOLULU:

A meeting of the Scientific Committee, International North Pacific Fisheries Commission, held at Honolulu, August 8-12, 1962, concerned itself with preparations for the Interim Meeting of the Commission, which was scheduled to convene at Honolulu, August 13, 1962. The Committee meeting was attended by a representative of the U.S. Bureau of Commercial Fisheries.

WHALE OILPRICES DECLINE:

According to sources from London, England, a sale of 60,000 long tons of whale oil was made some time during July 1962 at £45 (about US\$126) per long ton (about 5.6 U.S. cents a pound) ex-tanker Rotterdam, which was the lowest price in some years. The quantity was made up of British, Japanese, and Dutch oil.

A previous sale of 50,000 tons of Antarctic whale oil at £50 (about US\$141) per long ton (about 6.3 U.S. cents a pound) had been made about two months previous to July 1962. The lower price was the result of the steady decline in prices for competitive vegetable and fish oils.

Note: See Commercial Fisheries Review, August 1962 p. 85.

FISH MEALWORLD PRODUCTION, MAY 1962:

According to preliminary data from the International Association of Fish Meal Manufacturers, world production

of fish meal in May 1962 amounted to about 232,755 metric tons, an increase of 25.7 percent over world production in May 1961.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	World Fish-Meal Production by Countries, May 1962		
	May		Jan.-May
	1962	1961	1962
... (Metric Tons) ...			
Canada	2,376	1,643	35,808
Denmark	8,424	5,315	28,229
France	1,100	1,100	5,500
German Federal Republic	5,485	4,980	32,264
Netherlands	1/ 500	1/ 500	1/1,500
Spain	2,578	1,339	11,476
Sweden	459	270	2,329
United Kingdom	6,939	6,353	30,861
United States	38,433	31,242	50,772
Angola	1/ 100	6,363	1/10,442
Iceland	9,661	5,106	26,930
Norway	3,822	12,311	19,945
Peru	121,533	80,784	460,623
South Africa (including South-West Africa)	31,945	27,800	134,596
Total	232,755	185,106	851,375

1/ Data not available for May; data available only for January-April 1962.
Note: Belgium, Chile, Japan, and Morocco do not report their fish-meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish-meal production in May 1962 was mainly due to increased output in Peru (up 50.4 percent), the United States (up 23.0 percent), Iceland (up 89.2 percent), South Africa (up 14.9 percent), and Denmark (up 58.5 percent).

This year to date Peru had increased landings of anchoveta; menhaden landings in the United States, especially on the Atlantic Coast, were up; Iceland's landings of herring were up; South Africa's pilchard landings were higher; and Denmark's landings of industrial fish were up. The increase was partly offset by a sharp drop in fish-meal production in Norway because of the failure of this year's herring fishery. Peru accounted for 52.3 percent of world production (for countries listed in May 1962), and the combined production of Peru, the United States, and South Africa accounted for 82.5 percent of total production this May.

During the first five months of 1962, world fish-meal production for the countries listed was 851,375 tons. Peru accounted for 54.1 percent of total production during that period followed by South Africa with 15.8 percent, and the United States with 6.0 percent.

INTERNATIONAL WHALING COMMISSIONFOURTEENTH ANNUAL MEETING:

Scientists attending the Fourteenth Annual Meeting of the International Whaling Commission at London, England, June 25 to July 6, 1962, generally agreed that the whale resources of the world are in very poor condition. If the Commission does not act almost immediately, it seemed clear that the situation would continue to deteriorate.

The meeting was attended by representatives from Argentina, Australia, Canada, Denmark, France, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, South Africa, Sweden, the United Kingdom, the

International (Contd.):

United States, and the Union of Soviet Socialist Republics. In addition, observers were present from the Food and Agriculture Organization (FAO), the International Council for the Exploration of the Sea, Chile, and Italy. The first week was occupied by meetings of the Scientific Committee, and the second week by plenaries and other Commission committees.

In 1961, the Commission appointed a special committee of experts to study the extensive scientific data that are available. For various reasons, the work of this special committee did not proceed very rapidly in the past year. Funds now have been provided and it is expected that this committee will complete its work and submit its report in time for the Fifteenth Annual Meeting in June 1963. The Commission did not take positive action at the 1962 meeting, preferring to await completion of the special committee's report.

The return to the Commission of the Netherlands as a participating Government was considered significant. The consequences of this, and of the agreement made outside the Convention by the five Antarctic pelagic whaling countries for sharing the pelagic catch in the Antarctic were most important, as outlined in the opening speech by the United Kingdom representative. He pointed out that now that the agreement on catch-sharing had been reached, he hoped it would be possible to limit the Antarctic catch to the level which the stocks are able to bear. He considered the special scientific investigations on the condition of the Antarctic stocks, shortly to be undertaken, to be of vital significance, and hoped that the meeting would agree on the details of the International Observer Scheme.

In carrying out its principles, the Commission has limited the annual catch of Antarctic pelagic whales by blue-whale units each season. (A blue-whale unit equals one blue whale, or two fin whales, or two and a half humpback whales, or six sei whales). At the time of the Twelfth Meeting in June 1960, this limit had been 15,000 units but it was then suspended for two seasons for the four countries remaining in the Convention, with the exception of Japan and the U.S.S.R. who had objected to the suspension. No change in this over-all limit was suggested at the

1962 meeting so that it returns to 15,000 units again for the 1962/63 season. During the last Antarctic whaling season, when the over-all limit was still suspended, the Antarctic pelagic whaling countries had imposed on themselves the following voluntary limits: Norway 5,100 Netherlands 1,200, U.S.S.R. 3,000, Japan 6,680, and United Kingdom 1,800 units.

During the 1961/62 season, 21 expeditions operated in the Antarctic (7 Norwegian, 7 Japanese, 4 Soviet, 2 British and 1 Dutch) and caught a total of 15,253 blue-whale units. The number of whales in the total baleen catch was 1,118 blue whales, 26,438 fin whales, 309 humpbacks, and 4,749 sei whales. The total baleen catch in the 1960/61 season had amounted to 16,433 blue-whale units (1,740 blue whales, 27,374 fin whales, 718 humpbacks, and 4,310 sei whales). A total of 4,864 sperm whales were also taken by pelagic expeditions in the Antarctic compared with 4,681 sperm whales in 1960/61. The production of baleen and sperm oil in 1961/62 amounted to 2,005,087 barrels (6 barrels to the ton); in the previous season it was 2,123,571 barrels.

Only one Antarctic land station, at South Georgia, was operating in the 1961/62 season. A total of 1,194 whales were caught and 49,815 barrels of oil (baleen and sperm) produced. In the previous season when two companies were operating from three land stations the total catch of whales amounted to 2,317 and total oil production to 109,727 barrels.

Outside the Antarctic, 46 land stations and 3 floating factories were in operation in 1961. A total of 22,195 whales were caught compared with 24,313 in 1960. Total oil production, baleen and sperm, amounted to 646,676 barrels compared with 724,707 barrels in 1961.

The Commission considered the position of the former sanctuary in the Antarctic (the waters south of 40° south latitude from 70° west longitude westwards as far as 160° west longitude) for baleen whales against pelagic whaling operations. Since 1955 this area has been open to pelagic operations by decisions taken at previous meetings of the Commission. On the last occasion that this matter was considered by the Commission, in 1959, it was agreed that the sanctuary should remain open for a further three years, until November 8, 1962. At their Fourteenth Meeting, the Commission decided that it would be undesirable to close the Sanctuary again at this stage since

International (Contd.):

it might result in increased catching in other more heavily hunted areas. It was therefore agreed that the former sanctuary should remain open "until the Commission otherwise decided" and that the relevant paragraph of the Schedule to the Convention should be amended accordingly.

The Commission made no change in the length of the open season for Antarctic pelagic whaling which remains from December 12 to April 7.

At their 1960 meeting, the Commission altered the opening date for the taking of blue whales from February 1 to 14 and adopted measures for the further protection of humpback whales in closing Antarctic Area IV to humpback whaling by pelagic expeditions until the end of 1963 and by reducing during the same period the catching season in Antarctic Area V from 4 to 3 days starting on January 20. Because objections to these measures were subsequently lodged and not withdrawn by the member Antarctic pelagic whaling countries (Japan, Norway, the United Kingdom, and the Soviet Union), the measures were not effective during the 1960/61 and 1961/62 season. At their Fourteenth Meeting the Commission adopted a resolution calling upon those countries to reconsider their objections in view of the deteriorating position of the stocks of blue and humpback whales. At the same time, however, the Commission recognized that the Netherlands, who was not a member of the Commission when the measures were adopted, should be placed on the same footing as the other Antarctic pelagic whaling countries. A further resolution was therefore passed by which the Netherlands is enabled, if it so wishes, to register objections to the blue whale and humpback measures within 90 days from the date of their re-accession to the Convention on May 4, 1962.

Discussions on the setting up of an international inspection system of Antarctic pelagic factory ships were held during the meeting. No decisions were reached but the Commission is to convene a further meeting on this subject between the five Antarctic pelagic whaling countries. It was expected that this meeting would be held before the end of August 1962.

As a result of the recommendation of the Committee of Three Scientists and the Spe-

cial Scientific Committee with which they worked, the preparation of data to allow a proper appraisal of the stocks of whales in the Antarctic was completed by the national research units. It was hoped that at this meeting it would be possible to formulate in a precise way the state of some of the stocks of Antarctic whales and to see at what level the annual catch should be maintained so as to obtain the best yield. In view of a later meeting to be held by these special committees, there was no disposition at the Fourteenth Meeting to take any regulatory measures such as the complete restriction of the blue whale catch that the Scientific Committee advocated.

In view of a Japanese proposal to reduce the minimum size of sperm whales delivered to land stations in the Northwest Pacific, or over a wider area to 33 feet, the Scientific Committee was asked to undertake further study of evidence on the effect of reducing the minimum size of sperm whales both for land stations and factoryships in the North Pacific and elsewhere. A working group already set up to study the North Pacific whale stocks would be asked to do this task. (International Whaling Commission, London, England, July 7, 1962.)

Note: See Commercial Fisheries Review, Aug. 1962 p. 12.

EUROPEAN ECONOMIC COMMUNITY

CANNED SALMON IMPORT DUTY RATE LOWERED:

A lower canned salmon duty rate of 16 percent ad valorem was granted by the European Common Market on canned salmon imports from all members of the General Agreement on Trade and Tariffs (GATT) including the United States. The original duty rate fixed by the European Economic Community (EEC) was 20 percent. As a result of negotiations between EEC and the United States at the GATT meetings held in 1961, the duty was reduced from 20 percent to 18 percent. Canada, which had also negotiated with the Common Market on the canned salmon duty rate, claimed that a 16 percent rate had been promised. A review of the EEC-Canadian negotiations substantiated Canada's claim, and the rate was reduced to 16 percent.



Aden

UNITED STATES VESSEL TO FISH SPINY LOBSTERS OFF COAST:

A United States importing firm was making preparations in June 1962 to bring a 60-foot refrigerated fishing vessel to Aden to fish commercially for spiny lobsters along that Protectorate's coast. Fishing operations were scheduled to begin some time during the fall after the southwest monsoon season was over. The spiny lobster tails will all be for export to the United States.

The vessel, which is the first of its type in that region, will operate in the Mukalla area. It has a refrigerated holding capacity of 10 tons of spiny lobsters or lobster tails. It is expected that a 300-ton cold-storage plant will be completed by November in that area, and the United States firm has an option on space in the plant. The vessel will be capable of bringing in 10 tons of spiny lobster tails each trip for storage in the cold-storage plant, awaiting shipment to the United States. The enterprise depends on com-



pletion of the cold-storage plant. Meanwhile, the United States importing firm has an option on space in a smaller 60-ton cold-storage plant which is also being planned for Mukalla.

The Aden fishing industry has been in a state of uncertainty for several years, but has finally started moving forward. A representative of the United States importing

firm visited Aden at the invitation of that country's Marketing Department. He saw that spiny lobster fishing there looked promising, and negotiated for a United States vessel to fish the resource. The vessel was expected to arrive at Aden by the end of July. (United States Consulate, Aden, July 12, 1962.)



Angola

NEW FISH PROCESSING PLANT OPENED:

A new fish-processing factory opened on June 19, 1962, according to a report in the *Diario de Luanda*, June 11, 1962. The new factory is located at Equimina Bay, about 86 miles south of the city of Benguela. It will can, freeze, and dry fish as well as manufacture fish meal. It will also operate its own fishing fleet. No information is available as to the amount of the investment involved. (United States Consulate, Luanda, June 28, 1962.)

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TRAWLING REGULATED:

Portuguese Government regulations governing the type, equipment, and operations of trawlers fishing in Angolan waters were enacted by Decree No. 44,398, published in the *Diário do Governo*, in mid-1962.

The Angolan fishing industry recently acquired its first trawler. This decree may mean that additional trawlers will be added to the Angolan fishing fleet as part of general measures to improve the antiquated status of Angola's fishing industry. (United States Consulate, Luanda, June 28, 1962.)



Australia

SHRIMP FARMING EXPERIMENTS SHOW PROMISE:

An attempt to mass-breed shrimp in captivity is being made by a group of Australians. They hope to show that large-scale shrimp farming on a sound economic basis is possible along a vast stretch of the eastern Australian coast. Although the effort is still in an experimental stage, the indications are that it will be successful.

Australia (Contd.):

One of the group started his shrimp investigations in 1953, when employed by the Fisheries Department of the New South Wales Government. He already knew of one species of shrimp that bred in enclosed waters. This is the greasy back (Metapenaeus mastersii), a shrimp found only in Australia, that breeds freely in estuaries and lakes on the east coast from southern New South Wales to central Queensland.

Another of the Australian group became interested in the prospects of shrimp farming in Australia while serving with the Australian Forces in Japan. There he visited the Hiroshima district where he inspected a farm in which trapped offshore shrimp were fattened in several ponds of 2-3 acres in extent. With the idea of following the Japanese system, he leased a large section of mangrove swamp at Taren Point, on a southern fringe of Great Sydney, an area in Botany Bay, close to the estuary of the Georges River. Two ponds were dug, each measuring 75 feet by 40 feet and 5 feet deep.

In November 1958, 300 pairs of breeding shrimp were obtained from Lake Macquarie, about 65 miles north of Sydney, and released in the ponds. During the following weeks, the stock was breeding prolifically, and before long, several hundreds of thousands of young shrimp populated the ponds. Soon they were between a quarter and a half-inch long.

At this stage they had shed their shells many times as they developed into demersal creatures easily recognizable as shrimp. Their diet slowly underwent the usual change from herbivorous to omnivorous, and on to carnivorous as they became adults. The natural available food in the ponds was supplemented with chopped liver and crayfish meal.

Because of lack of scientific knowledge, plus ignorance of the food requirements of the rapidly growing young, the mortality rate was extremely high. The oxygen in the water became depleted and the shrimp died by hundreds of thousands. One pond was opened to the sea and many of the still-living shrimp left for the bay. But many stayed on, reaching full maturity once the pressure had been removed from the food and oxygen resources. Some shrimp also reached maturity in the fully enclosed pond. These facts made it

clear that shrimp farming was possible but it was obvious that the two original ponds were not big enough for the populations they were called on to support.

Later a shallow tide-fed estuarine pond was provided covering an area of 10 acres, and rich in weed and both animal and vegetable plankton. Stocking of the pond began on September 6, 1960, and small quantities of breeding shrimp were periodically released until the end of the year. Altogether, 900 pairs of migrant shrimp were introduced into the pond. Early in 1961, microscopic examination of water samples showed the presence of large numbers of shrimp larvae. A little later hundreds of thousands of young, each measuring about a quarter-inch long, had developed to the demersal stage. Subsequent investigations revealed a huge population of healthy young shrimp growing to adulthood.

The group was confident that the experiment would prove to be a great success. But an unknown factor then became evident. When an assessment of part of the pond was made in August 1961, it was found that the population had only tripled itself. Earlier indications had been that the original population would have multiplied several thousand times. Seeking a reason for this devastating result, the experimenters came to the conclusion that water pollution from chemical and other factory waste had probably caused the enormous mortality in the pond. Sufficient results were achieved, however, to convince the group that true shrimp farming was filled with the best of prospects.

One of the group said, that the number of shrimp that can be raised in ponds of given sizes is one of the vital facts they are trying to establish. It is known that a female is capable of spawning twice a season at the rate of about 250,000 eggs each time. As with all animals of high fecundity, the mortality is enormous, but from 5,000 to 10,000 eggs may develop into individuals. It is not known yet what order of population will emerge under the conditions in the pool. Mortality may be higher or lower than elsewhere. It may also be hard to maintain food supplies. Shrimp need different diets at different times of their lives. The young are plankton-eating vegetarians. It is therefore necessary to increase the productivity of plankton in enclosed ponds and this calls for complex procedures, including the use of fertilizers. As the growing shrimp pass through the omnivorous stage to become almost entirely carnivorous,

Australia (Contd.):

more prepared foods such as liver meal will have to be used. The successful use of this system of feeding on a commercial scale can be decided only by experiment.

The Australian group sees farming as a means of filling a gap in the existing Australian shrimp industry.

One of the group said today's harvest by the usual means depends to a great extent on weather and other conditions outside the control of fishermen. Supplies, as a result, vary greatly. Glut and scarcity follow each other in a monotonous cycle. Shrimp farming would play a major role in stabilizing the industry. Harvests could be gathered when shrimp from the usual sources are scarce. (World Fishing, April 1962.)

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SOUTHERN WEST AUSTRALIA TUNA SURVEY RESULTS:

A spotting plane was used by the Australian chartered tuna survey vessel Estelle Star to locate schools of fish. No tuna were sighted by the spotting plane on the first six flights (May 7-9) which covered the Albany area and Cape Naturaliste to Jurien Bay. Another series of flights over a three-day period were planned for May, two series were scheduled for June, and another two series for July.

The survey of tuna resources in southern West Australia began in August 1961. It is being carried out by the Fisheries Division, Department of Primary Industry, in association with CSIRO Division of Fisheries and Oceanography.

When it was announced that a spotting plane would be used in the survey, Australia's Minister for Primary Industry said funds for that purpose had been made available from the Fisheries Development Trust Account which was also financing the survey by the Estelle Star.

The Minister said it was possible for spotters to identify the fish from a height of about 1,000 feet. The aircraft would make sweeps of the area in which the Estelle Star was to work each two weeks at new moon and full moon because those were the times when tuna were most likely to be near the surface.

The spotting plane is a twin-engined Aero 145, with cruising speed of 160 m.p.h. and range of 800 miles. It has cabin accommodations for three in addition to the pilot.

The vessel's operations out of Albany from April 13 through May 10, 1962, yielded catches of southern bluefin tuna by trolling on six days in April. A total of 90 tuna were caught, mostly in the Bald Head area, of which 70 were tagged and released. In May, on seven days from May 1-May 10, a total of 280 tuna were caught with pole-and-line and 351 were trolled; a total of 631 fish (all southern bluefin). Of that total, 566 were tagged and released. Most of the fish were caught off Bald Head.

The best day was May 8 when the vessel in the area between Bald Head to Cave Head caught 250 tuna--157 with pole-and-line and 93 by trolling. Most of the fish were caught 50 yards off Bald Head. Of the total caught that day, 230 were tagged and released. (Australian Fisheries Newsletter, June 1962.)

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TUNA FISHERY TRENDS, 1962:

A record 3,715 short tons of tuna was landed during South Australia's 1962 tuna fishing season which ended May 26, 1962. Most of the catch was for the South Australian Fishermen's Cooperative, and the balance for a cannery at Eden in New South Wales. The 1961 season's catch was 2,480 tons.

The New South Wales 1961/62 season was disappointing. Bad weather was responsible for the light tuna landings of 1,737 tons, compared with 2,363 tons the previous season.

The 1961/62 season tuna landings for South Australia and New South Wales combined totaled 5,452 tons, compared with 4,844 tons landed during the 1960/61 season. The tuna fishery in other Australian states is minor. (Australian Fisheries Newsletter, July 1962.)

**British Guiana****SHRIMP EXPORTS, 1961:**

British Guiana's shrimp exports in 1961 totaled almost 4.2 million pounds, valued at W.I.\$2.7 million (US\$1.6 million) f.o.b. point of export. The United States received 90.2 percent of British Guiana's total shrimp exports in 1961.

British Guiana (Contd.):

British Guiana's Shrimp Exports in 1961 by Countries

Destination	Quantity	Value	
		Pounds	W.I. \$
United States	3,674,832	2,388,559	1,393,318
United Kingdom	282,450	213,668	124,638
Trinidad	177,450	115,494	67,371
Other countries	35,468	23,278	13,579
Total	4,170,200	2,740,999	1,598,906

Note: One W.I. dollar equals about 58,333 U.S. cents.

Source: Department of Customs and Excise, Georgetown, British Guiana.



Canada

ARCTIC CHAR FISHERY:

Eskimo fishermen expect to market 100,000 pounds of Arctic char during 1962. This specialty product, almost unknown outside the arctic only four years ago, is now distributed in many parts of Canada. It was introduced to British housewives in June 1962 when a firm in London, England, imported 10,000 pounds. Arctic char, or "ilkalupik" as the fish is known to the Eskimos, has a pink meat. It can be prepared like salmon or trout, but it has its own distinctive flavor.

The commercial fishery for Arctic char was started in Frobisher Bay in the eastern Arctic in 1958, following popular acceptance of a trial shipment to Montreal, Canada. Fish-freezing facilities were installed at Frobisher Bay before the start of the 1959 season. The char run is short and a year's harvest must be caught, frozen, and packed during a month or six weeks. An annual fishery quota of 12,000 pounds was established for the Frobisher Bay fishery.

Other fishery stations were soon needed to meet the demand for this new product. A study by the Arctic unit of the Canadian Research Board showed that prospects were promising for a commercial char fishery at George River in northern Quebec. In this remote part of Canada, some 100 Eskimos were eking out a living off the land. None had ever worked in a commercial fishing operation, but in 1959, with the aid of officials from the Canadian Department of Northern Affairs they established a small fishery cooperative. The Canadian Government then provided a loan for the purchase of supplies and fish-processing equipment and with a tentative quota of 30,000 pounds of char set for the season, the first Eskimo fishermen's

cooperative began operating. Cooperatives were later established at Port Burwell in the eastern Arctic, and at Fort Chimo and Cambridge Bay on Victoria Island in the central Arctic.

At Frobisher Bay, the entire catch is now marketed locally. The Cambridge Bay fishery is Canada's most northerly fishing center, and the char catch from there is used to supply the western part of Canada.

The growth of the cooperatives has enabled the Eskimos to harvest resources that for years had been without economic benefit to them. The point has been reached where the Eskimos are running the enterprises themselves, and the financial returns have had a marked effect on their general standard of living.

Up to the beginning of 1962, a total of 107,000 pounds of Arctic char had been produced by the cooperatives; the production for 1962 has been set at 100,000 pounds--an increase of 100 percent over the previous year's production. (Fish Trades Gazette, June 23, 1962.)

Note: See Commercial Fisheries Review, July 1960 p. 53.

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NEW PRODUCTS BEING DEVELOPED FROM UNDERUTILIZED FRESH-WATER FISH SPECIES:

Some people believe that fish stocks in the Great Lakes are depleted, but that is not so, according to the Chief of the London Ontario Technological Unit of the Fisheries Research Board of Canada. In an interview, he went on to explain that what really has happened is that there has been a change in fish populations in the Great Lakes. There has been a decline in lake trout and whitefish populations, but an increase in underutilized species, or so-called "trash" fish, which presently find very limited markets.

According to recent surveys made in the United States, 30 to 40 percent of the food products sold are products which were not on the market 10 years ago. New products, especially the fully-prepared and partially-prepared convenience foods, are opening new markets for food processors in Canada and in the United States.

One great, underdeveloped food resource is the Canadian inland fisheries. Ontario's Great Lakes and many lakes of the Prairie Provinces contain living silver which fish processors with initiative could convert to gold. Perhaps the reason they are not doing so is because they are not yet aware of the possibilities.

Underutilized Fresh-Water Fish Species: Lake Erie contains more species of game fish, commercial fish, and potentially commercial fish, than any other body of water in Ontario. In recent years the dominant species in the catch from that lake has varied through

Canada (Contd.):

whitefish, blue pike, yellow pike, and yellow perch, to smelt.

When the smelt first appeared in Lake Erie, they were considered a nuisance by the fishermen. There was little or no market for them and economical means of fishing them had not then been devised. But when they became so abundant that they clogged up nets set for other fish, steps had to be taken. Suitable smelt fishing gear was developed and gradually a year-round market for fresh, frozen, and processed smelt was built up. At the present time the consumer market absorbs about 15 million pounds of Lake Erie smelt a year. But the lake could produce a much larger quantity if there was sufficient demand. Some estimates are as high as 50 million pounds a year.

In Lake Ontario there are thousands of tons of alewives, but they are not being fished because of lack of



A Manitoba commercial fisherman sets his gill nets under the ice on Lake Winnipeg with a "jigger." After the first hole in the ice has been cut, it is possible to set 50 fathoms of net in three minutes with this simple device.

markets. In Lake Huron there is a large chub (a variety of fresh-water herring) population, but the fishery has been limited due to market problems. The Fisheries Branch of the Manitoba Department of Mines and Natural Resources is desirous of finding markets for such species as suckers (mullet) and burbot (maria). Carp, sheepshead, buffalofish, and yellow perch could be exploited to a much greater degree than they now are.

The whitefish is one of the most popular of the fresh-water fish. But the meat of whitefish from some Canadian lakes contains foreign bodies (such as cysts) which though harmless to the consumer, interfere with marketing of the fish. At the present time the only practical method of handling such whitefish is to skin, fillet, and candle them. The foreign bodies show up as dark shadows and are cut out. A proportion of the cut-out fillets are used to make "gefille fish," but there is room for developing additional markets.

Research on Underutilized Species: Unwanted fish species have one thing in common--they are not popular with consumers. The underlying cause of their unpopularity varies with the different species. The fact that these fish are unpopular does not mean that they lack potential for the consumer market. Food technologists feel that a more complete knowledge of their composi-

tion and a better understanding of how to handle, process, and market them could mean the difference between an unsalable food product and a readily salable one.

The London Technological Unit of the Fisheries Research Board of Canada, in the five short years of its existence, has been actively investigating the underutilized fish problem in the Great Lakes and has made some useful discoveries.

Studies of the nutrient composition of each of the problem species have been made and are still in progress. As some of the species have been found to deteriorate rapidly, studies of the microflora (especially the spoilage organisms) found on them have been initiated. Studies of fishing gear, fish-processing equipment, and means of handling fresh-water fish products are a continuing part of the Unit's program. A senior scientist at the Unit is developing a variety of new products from the underutilized fish species which may have commercial application.

New Products from Underutilized Species: One of the scientist's current projects is the development of sausage-type fish products. Fish sausages, he affirms, are 100 percent edible, high in food value, and require little attention from the cook. If produced on a commercial scale to compete favorably in price with meat sausages, they would likely find a ready market. Three types of sausage are being investigated: (1) uncooked fish sausages, (2) cooked fish sausages (bologna-type rolls), and (3) cooked smoked fish sausages ("wiener"). All three have been prepared experimentally with success and seem to have a good market potential. More work has been done on the fish "wiener" than on the other two types of sausage.

Fish "wiener" have been prepared from burbot, carp, catfish, perch, sheepshead, smelt, sucker, and whitefish. All varieties with the exception of smelt have proved satisfactory. Carp and whitefish, because of the cohesive properties of the meat made the best "wiener." Blends of various species, especially those containing carp and whitefish, were excellent. Smelt was unsatisfactory because the meat lacked cohesiveness and developed a dirty grey color when minced.

The basic procedure for making fish "wiener" is as follows: Chunks of frozen fillets are minced to a pulp in a grinder and blended according to a precise formula with fat, spices, water, and a cereal binder. The homogenized product is then stuffed into animal or cellulose casings and tied off in links. Chains of these links are smoked according to a predetermined schedule, following which they are cooked in water and chilled.

The finished "wiener" look like meat wieners. They can be formulated to taste like meat "wiener" or to retain a distinctive fish flavor, whichever is desired. Work on them is continuing as there are still a number of variables to be determined before approved formulae can be offered to commercial producers.

Rivaling the "wiener" in popularity are the fish Bologna-type rolls. These are prepared from skinned fillets pressed together in a transparent casting with a binder substance like egg albumin, and then cooked. As is the case with the "wiener," it is important that the fish species selected to make the rolls have meat with good cohesive properties. Three such species found to make excellent fish rolls are whitefish, carp, and pike.

Canada (Contd.):

An interesting sidelight of the work on the fish sausages had to do with the mincing operation. Up to now, dressed fish could not be used to make sausages because of the bone. If in processing the bone could be finely ground and homogenized with the meat, the nutritional value of such products would be increased and the filleting operation eliminated. Recently a new cutting mill has been put on the market which reduces fish meat and bone to a smooth paste at a low temperature, using centrifugal force. The first one of its kind in Canada was expected to be delivered to the London Technological Unit.

Cut-out whitefish fillets have been tested in several new products, one being fish ball "servies"--all that has to be done is to heat and serve them. "Servies," like the sausages, are prepared from homogenized fillets. They are about the size of golf balls, golden brown on the surface and smooth, firm, and white on the inside. Their flavor is mild.

If produced commercially, the "servies" might be frozen and marketed in boilable plastic bags, each bag of a size to contain an individual serving. Ease of preparation would seem to make this product ideal for use in institutions where quick service is essential.

Another possible new use for the cut-out whitefish fillets is in patties. Fish patties have been prepared by molding uncooked minced fish in a patty-molding machine developed for the commercial manufacture of meat patties. Before serving, the patties were cooked by various means such as deep-frying, sauteing, baking, and boiling in a plastic bag. Three varieties of fish, whitefish, perch, and smelt, have been used to make the patties. Whitefish made excellent patties with smooth texture and good flavor. Perch patties were also good. Smelt did not make a product of acceptable quality.

A number of the new products developed have been freeze-dried in the medical laboratories of the Defense Research Board of Canada. Of these, the minced fish patties have been one of the most successful. Freeze-dried minced fish patties may be a food item that will develop successfully in the future.

A new method of dressing chub prior to smoking has been developed by the London (Ontario) Technological Unit. Chubs are found in substantial quantities in Lake Huron. The heads, tails, fins, and viscera are removed and they are spread open and flattened in such a manner that when viewed from the skinless side each fish looks like a fillet. After being dressed, they are soaked in brine and then smoked at temperatures progressing from 120-170° F. They emerge from the smoke tunnel fully cooked.

Canned Products from Underutilized Species: When the London Technological Unit was established in 1957, one of the first problems brought to its attention was the lack of market outlets for smelt, especially during the glut season. Canning, it was felt, might be an answer and so smelt canning experiments were initiated. The smelt were canned following basic fish canning procedures developed earlier at the Fisheries Research Board's Vancouver Technological Station.

As the work progressed, innovations were made. The smelt were canned in just about every conceivable manner which seemed practical. They were given various precanning treatments such as brining, smoking, marinating in vinegar, and breading followed by pan frying.

They were packed in various forms such as whole and ungutted, whole dressed, as fillets, and as rolled fillets ("rollmops"). They were packed with and without the skin removed. They were processed with added salt and with such other additives as oil, spices, and sauces. Some of the treatments produced better results than others. In general, however, the results indicated that a satisfactory canned smelt product can be obtained.

Canning experiments at the Unit were not confined to smelt alone. As additional equipment was installed, the experiments were broadened to include a wide variety of species from both the Great Lakes and the lakes of the Prairie Provinces. The following general observations resulted. Canning appeared to develop the flavor of certain species but not others. In some, it produced an undesirable aftertaste which may or may not be caused by overcooking or undercooking. The texture of canned fresh-water fish generally tends not to be as firm as that of canned salmon. It was found that fish of the same species taken from different lakes will, on canning, exhibit different flavor and texture characteristics.

When asked which of the Unit's canned products had the greatest potential for the Canadian market, one opinion was that whitefish canned in the salmon-type pack was an attractive product and could be rated first for flavor, with canned suckers a close second. Regarding the export market, it was believed that canned alewives, which could be produced at very low cost, might find favor in newly-developing countries. (*Canada Trade News*, May 1962.)

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NEW TAX APPLIES TO SHRIMP IMPORTED FROM THE UNITED STATES:

A new Canadian tax on imports has, in effect, offset the reduction in the duty rate on fresh, frozen, and canned shrimp granted to the United States in recent negotiations under the General Agreement on Tariffs and Trade (GATT). On July 1, 1962, the Canadian duty on shrimp imported from the United States and elsewhere was reduced from 10 percent to 5 percent ad valorem. Effective June 25, 1962, however, a 5-percent surcharge was added to many Canadian import duties including the duties on shrimp and other fishery products.

The surcharge or tax was one of the steps taken by the Canadian Government to stabilize its currency and to overcome balance-of-payment difficulties. Under the GATT, however, these surcharges must be removed as soon as these conditions have been corrected.

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PURSE SEINERS IN NEW BRUNSWICK CAN'T FISH WITHIN ONE MILE OF STATIONARY FISHING GEAR:

A new amendment scheduled to become part of Canada's New Brunswick fishing regu-

Canada (Contd.):

lations will prohibit purse seiners from operating within one nautical mile of fishing weirs and trap nets during the summer fishing season, according to a June 5, 1962, announcement by Canada's Department of Fisheries.

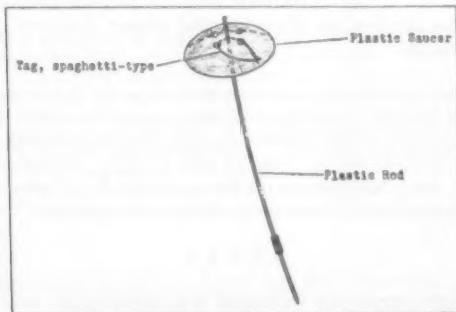
Canada's Fisheries Minister stated that steps were being taken to amend the regulations in force, which allow purse seiners to fish within one-half nautical mile of stationary fishing gear after discussions with the operators of weirs and trap-nets, as well as with the operators of purse seiners, particularly those in the Bay of Fundy area of Charlotte County, New Brunswick.

When in force, the one-mile restriction will be for the period April 15 to November 15 inclusive, which is the time when almost all the weirs and trap-nets are in operation. For the remainder of the year, purse seiners will be permitted to operate within 2,000 feet of any weir, trap-net, or any other stationary fishing gear being used.

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SEA-BED DRIFTERS USED TO STUDY NORTH ATLANTIC OCEAN CURRENTS:

A simple device called a sea-bed drifter is being used to get information about ocean currents. It consists of a weighted plastic rod with an orange plastic saucer at the top. Each drifter has a spaghetti-like tag tied to it. Scientists of the Fisheries Research Board of Canada are studying ocean currents that flow over the rich fishing banks along the Atlantic coast of Canada by using these devices.



Large numbers of sea-bed drifters were released over the Canadian Atlantic fishing

banks. They will be carried on the sea bed by currents and may be caught by fishermen in their otter-trawl nets or they may be washed ashore.

Fishermen or others recovering sea-bed drifters are asked to send the tag to the Fisheries Research Board at St. Andrews, New Brunswick. The Board wants to know the date and position of drifter when found as well as the kind of fishing gear, if applicable, with which it was picked up. The Board will pay a reward of one dollar for each sea-bed drifter tag returned with the required information. A description of where and when the sea-bed drifter was released will also be given those sending in tags. (Canada's Trade News, June 1962.)

Note: See Commercial Fisheries Review, March 1962 p. 21.

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SEA LION CONTROL PROGRAM IN COASTAL WATERS OF BRITISH COLUMBIA:

Professional hunters were hired by Canada's Department of Fisheries in 1962 in an attempt to reduce the number of sea lions in important fishing areas along the British Columbia coast. Sea lions have always plagued the gill-net and troll fisheries in certain of the better fishing areas. Some fishermen have had severe losses of catch, gear, and fishing time because of the animals. The total populations of sea lions in waters adjacent to British Columbia is estimated at 7,000-8,000 animals. Professional hunters have not been used before. In the past, Departmental officers stationed in areas where sea lions are known to be numerous have tried to control the sea lion population.

The new sea lion control program was described as "strictly experimental." But it has the full support of research scientists of the Fisheries Research Board of Canada who conduct extensive and continuing studies of sea lions in Canadian waters. Hunting is done under the close supervision of a scientific personnel or Fisheries Officers. A Vancouver company was given a contract for a four-week hunt. One week of the hunt was completed by June. Later in the season, the hunters were to return to the coastal areas for the remainder of the contract period.

The contracting company was also granted a permit to take 1,000 sea lions from rookeries at Cape St. James and in the Scott Islands. The sea lion control program in coastal waters is entirely separate from the com-

Canada (Contd.):

mercial hunt in the rookeries. This is the fourth year the company has engaged in the commercial sea lion hunt at the major rookeries. Investigations have shown that the reduction of sea lion stocks at the rookeries had no significant effect upon populations in areas near the fishing grounds. (Canada's Trade News, June 1962.)



Cook Islands

JOINT JAPANESE-NEW ZEALAND TUNA BASE:

The Japanese are to take part in a tuna industry base at Rarotonga, Cook Islands. A canning factory is to be built at Rarotonga by a firm in the Cook Islands which is a subsidiary of a Dunedin, New Zealand, firm. The Japanese will provide boats and crews to catch the fish for the cannery.

Final details of the joint Japanese-New Zealand venture were being worked out in May 1962. Part of the deal is that the Japanese must help to train Cook Islanders in their boats. Each boat will train four Cook Islanders each year and use them at the end of their training to replace Japanese crew members. Eventually full crews will be Maori, under the scheme. However, the boats and the profits from the sale of the catch would still belong to the Japanese.

Meanwhile, the Cooks' Director of Fisheries is still going ahead with his plan to train Cook Islanders for tuna fishing. He is using Japanese fishing equipment. (Pacific Islands Monthly, June 1962.)



Denmark

FILLETING ASSOCIATION SEEKS CLOSER CONTACT WITH FISHERMEN:

At the annual meeting of the Danish Flatfish Fillet Association in Esbjerg in late June 1962, it was noted that no decision was expected on the request that the filleting of frozen fish be approved until the Fisheries Ministry's Research Laboratory completed its study later in the year. There are divided views of the proposal in the Association. Filleting machines for flatfish are in use in

several filleting plants, but it is not yet possible to exercise final judgment on their value. The increase in the minimum size of plaice is a development in the right direction--larger fillets--but it is minor and has not been in effect long enough to determine any effect on prices.

Association members were not opposed to minimum prices sought by fishermen but indicated low prices were due to lack of organization with respect to landings. Fishermen seek the fish they can catch, leaving the distribution problem wholly to the buyers. This adversely affects prices and makes it difficult to take advantage of special supply and demand situations. Better contact between the filleters and the fishermen was urged for their mutual benefit. (Fisheries Attaché, United States Embassy, Copenhagen, July 4, 1962.)

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FISHERIES TRENDS, JAN.-JUNE 1962:

Denmark's fishing industry may set new annual records for the amount of fish landed and the value of fish exported. Landings in January-June 1962 were 8 percent ahead of the same period of 1959 when the record annual catch was made. The value of exports of fishery products during the first half of 1962 was 16 percent greater than in the same period of the record year 1961. The value of exports of canned herring during the first half of 1962 was four times greater than in the same period of 1961; exports of lobster tails doubled in value; and exports of cod fillets increased 12 percent in value. But the value of exports of pond trout was down 33 percent. Denmark's total fishery products exports to the United States in the first half of 1962 were worth 26 percent more than in the same period of 1961.

Denmark's increased exports were achieved without subsidies. The fishing industry in Denmark contributes only one-half to one percent of the gross national product but accounts for about 5 percent of all exports. A need for Government or joint Government-industry support of ex-vessel fish prices has been expressed by fishermen. (United States Embassy, Copenhagen, August 1, 1962.)

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INDUSTRIAL FISH LANDINGS WERE HEAVY IN JUNE 1962:

Fish reduction plants in the Esbjerg area of Jutland on Denmark's North Sea coast were overwhelmed with landings of in-

Denmark (Contd.):

dustrial fish, especially sand eels (*Ammodytes lanceolatus*) in June 1962. Sand eels are characterized as "soft" fish and lower appreciably the capacity of the reduction plants when not mixed with "firm" industrial fish, such as horse mackerel, whiting, etc. Between 4,000 and 5,000 metric tons of sand eels were reported landed in one day. Ultimately, this resulted in the dumping of 500 tons or more of sand eels at sea for which the cooperative reduction plant paid the fishermen the contract ex-vessel price of \$26.10 a metric ton. Cutters were placed on tonnage limits, deckloads were banned, and they were required to land in rotation. Prices for "firm" fish were temporarily increased from \$26.10 to \$29.00 a ton to induce fishermen to land those varieties.

During the period of restricted landings arrangements were made for cutters to land their catches in Norway and West Germany with IJmuiden in the Netherlands also expressing interest. Industrial fish landed in Cuxhaven, West Germany, by Danish cutters brought \$21.03 a ton and in Egersund, Norway, \$21.39 a ton. Under the circumstances, these net prices were considered reasonably satisfactory, although somewhat lower than the gross price of \$26.10 a ton prevailing in Esbjerg from which, however, landing costs must be deducted. By July 1 the landing limitations in the Esbjerg area had been raised considerably and it appeared that plant capacities again were in line with landings.

The immediate future of the Danish fishery for industrial fish was brightened by two decisions made at the Hamburg meeting dealing with North Sea Convention matters in May. The dispensation permitting Danish fishing vessels to land up to 10 percent undersize whiting in their industrial fish catches was continued until June 1, 1966. And a regulation in the Skagerak-Kattegat area, permitting small Danish craft to use a mesh smaller than prescribed by the Convention and to land unlimited amounts of undersize whiting, used mostly for brook trout and mink food, was extended until June 1, 1964. (Fisheries Attaché, United States Embassy, Copenhagen, July 4, 1962.)

* * * * *

POND CULTURE OF RAINBOW TROUT:

Raising rainbow trout in ponds in Denmark is primarily a fresh-water culture, but some experiments have been conducted in rearing trout in salt-water ponds. In its 1960 annual report, the Technological Research Laboratory of the Danish Ministry of Fisheries stated that samples of rainbow trout transferred from fresh-water ponds for further rearing at a salt-water trout farm developed meat that was distinctly red. At the time of transfer, the fish ranged in weight from 3.5 ounces to 5.3 ounces. Their meat remained light-colored after a period of from 1 to 2-1/2 months in the salt-water pond, but after about 4 months the meat was a definite red color. There is very little salt-water culture of rainbow trout in Denmark, and experiments made so far were not successful in the opinion of some observers.

Salt-Water Culture of Rainbow Trout: To some degree, the unsuccessful experiments in salt-water rearing of rainbow trout may have been due to technical difficulties, such as barriers being broken down by storms, or fish being killed because of oxygen deficiencies in hot weather because of lack of currents in the water. Also physiological difficulties may have occurred, especially in winter, when the fish are unable to maintain the osmoregulation necessary to compensate for the salinity of the water. Nothing is done to control the salinity in the ponds. As a general rule salinity must not exceed 15 percent in the summer, and 10 percent in the winter.

In Denmark, rainbow trout reared in salt water are fed on fish just as they are in fresh-water ponds.

There has been little experience with diseases of rainbow trout raised in salt-water, but a bacterial disease resembling furunculosis has been observed, which was cured with sulfamerazine.



Fig. 1 - Fresh-water rainbow trout pond at Brøns, Denmark, about 45 miles south of Esbjerg. Originally started by trout pond operators as a research station, it was later offered to the Danish Government for research. Now it is jointly operated by the Government and the trout growers. Research is conducted to obtain better growth by experiments in genetics--mating best growers. Dry food from the United States is fed to the young trout, but older trout get fresh fish from Esbjerg.

Fresh-Water Rainbow Trout Culture: The common food used in fresh-water trout culture in Denmark is salt-water fish not used for human consumption--mostly small herring and whiting, and several other species. Dry food in pellet form is used to some extent when fry are fed in troughs.



Fig. 2 - Weighing Danish rainbow trout raised in fresh-water ponds. In 1961 about 7,000 metric tons of trout were produced in Danish ponds.

Denmark (Contd.):

As a rule, a quantity of about 100,000 pounds of trout is produced by a team of three men. (That production data assumes that fingerlings are not produced.) Normally a trout farm of that size has no production of fry and fingerlings. Usually the fingerlings are brought from smaller trout farms. Those smaller farms only feed the fish from the fry to the fingerling stage and they are then sold in the autumn or spring to the regular trout-producing farms.

The trout are marketed by the farms in three ways: packed in ice, frozen, and alive. Normal sizes of the fish are from 5.6 to 7.8 ounces, and from 7.8 to 9.2 ounces, but smaller amounts of larger fish also are sold. Live fish are transported by tank truck and rail tank cars to such countries as Switzerland, Belgium, Germany, France, Norway, Austria, Italy, and the Netherlands.

In Denmark, there are hatcheries which produce eggs and fry almost exclusively. Farms which produce commercial fish and eggs for export are also found. There are also farms which produce eggs, fry, fingerlings, and commercial trout.

The Danish Government does not operate any of the trout hatcheries that are operating. Fish for stocking domestic ponds are produced by privately-owned hatcheries. No government subsidies of any kind are given for the production or export of rainbow trout. (Regional Fisheries Attaché, United States Embassy, Copenhagen, July 18, 1962.)

* * * * *

SEAWORTHINESS OF STEEL CUTTERS UNDER STUDY:

A study of the seaworthiness of Danish steel fishing cutters will require the construction of models and take one year, according to a professor of Denmark's Technical University, Copenhagen, who is now preparing a plan for the investigation. Fisheries Minister Normann requested the study of the stability of the steel cutters after three sank in the North Sea in a storm in February 1962. Many have contended that the traditional wooden cutters are preferable because they withstand heavy weather better.

At the end of 1961, the motorized Danish fishing fleet numbered over 8,000 vessels of which 96 were steel cutters, mostly measuring 95 to 120 gross tons. (Fisheries Attaché, United States Embassy, Copenhagen, July 4, 1962.)

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SECOND DANISH-BUILT FISH-FREEZING VESSEL FOR U.S.S.R.:

After only 19 days in the working dock, a Copenhagen shipyard launched the M/S Vitus Bering on June 9 for V/O Sudoimport, Moscow. The vessel is the 21st refrigerated type constructed by the shipyard for the U.S.S.R. since World War II and is the second in a series of four fish carriers.

The vessel has a dead weight of about 2,600 tons, is 91 meters (298.5 feet) in length between perpendiculars, and has a beam of 16 meters (52.5 feet). It is driven by a 6-cylinder Diesel engine developing 3,530 horsepower. Speed during loaded trials was 14.0 knots. Auxiliary machinery consists of three 6-cylinder and one 3-cylinder Diesel engines. In the boiler room is an oil-fired boiler with a steam production of about 3,000 kilograms per hour. The propelling machinery and refrigerating machinery are located amidships, with large refrigerated-cargo holds fore and aft. The quarters for the vessel's crew and factory staff (about 102 men) are extremely comfortable, considering the general standard of accommodation in fishing fleets. Specifications are the same as for the Skrylev, the first in the series, christened May 10, 1962.



Fig. 1 - The M/S Vitus Bering, fish-freezing vessel built in Denmark for the U. S. S. R. Shows vessel almost completed on 19th working day.

The Vitus Bering is equipped with control-pitch propeller which can be operated either from the main bridge or from a small bridge placed immediately above the stern ramp. In view of the very stringent requirements with regard to accurate and careful maneuvering while the catch is being taken aboard, the vessel is also equipped with a so-called "activated rudder," consisting of an electrically-driven propeller mounted in a nozzle on the actual rudder. This special rudder arrangement makes it possible to turn the vessel even when she is making no headway.

Denmark (Contd.):

Construction time in the dock was cut from 74 to 19 days by assembling the vessel in six sections. The sections were carried to the building dock by means of two large gantry cranes which have a capacity of 600 tons in one lift. The main engine, weighing 90 tons, was also lifted into the ship in one piece. In addition to reducing the time of construction, the prefabricated method of ship building reduced the amount of out-of-door work required. The work was thus less hampered by bad weather.

The Vitus Bering is intended to serve as mothership and refrigerated fish carrier for the Soviet trawler fleet operating in various waters--the North Atlantic, the Arctic Ocean and the Pacific Ocean. She represents the most up-to-date trends in her field.

The catch will consist mainly of cod. The vessel is provided with a large ramp at the stern so that the fish can be taken aboard direct from the sea, and there is a gate with which to close the opening. The fish are taken over from the fishing fleet in two days. Either direct from the vessels over the ship's side as hitherto or, as something entirely new, from trawl bags which are left by the trawlers in the water and marked by a buoy. Often these buoys are provided with radar reflectors so that the Vitus Bering will be able to locate them easily by means of radar.

total of 10 metric tons of scale ice per day. Irregular fish is sorted out on the deck and poured into the raw product bunker of the fish-meal plant.

From the raw product bunker all transport of the fish is mechanical right up to its being stored in cartons in the holds. On the way the fish is slit open and gutted. This process is still done manually but with automatic feed and removal at the working places. There are special machines for cutting off the fish heads. After washing in continuously-working washing machines, the fish is weighed out automatically in portions of about 10 kilograms (22 pounds), tipped into trays with spring-loaded lids and taken to the freezing tunnel.

After approximately half an hour's freezing, the lids are removed and the block of fish, which will now retain its shape, is given about four hours' final freezing. Then the fish is loosened from the trays by superficial thawing, it is glazed by immersion in water for a few seconds, and is taken via a reception conveyor on to the packing site. The entire further preparation of the iced fish requires only 4 men, whereas in previous refrigerator vessels delivered to the Soviet Union, this work required 8 men.

The entrails and fish heads are taken automatically from the cutting tables to the raw product bunker of the fish meal and fish oil plant, which has a capacity to process 30 tons

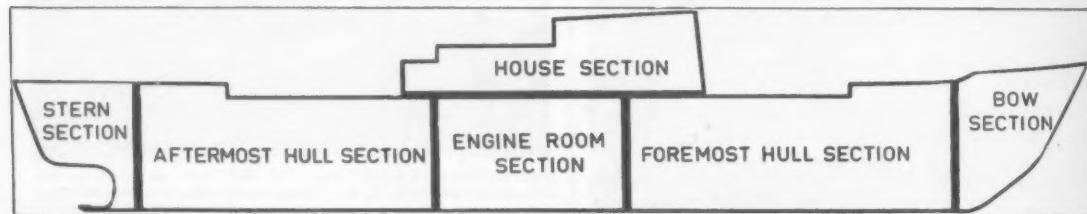


Fig. 2 - The M/S Vitus Bering was constructed from six sections. On the 1st working day (May 12, 1962), the keel was laid down and engineroom section erected (weight 425 tons). On 3rd working day (May 15), aftermost hull section erected (weight 357 tons). On 4th working day (May 16), the stern section erected (weight 86 tons). On 11th working day (May 26), foremost hull section erected (weight 414 tons). On 13th working day (May 29), bow section erected (weight 76 tons). On 19th working day (June 7), house section erected (weight 149 tons).

By means of a line-throwing apparatus, a catching device is shot over a floating line attached to the bag. A powerful winch then hauls the catch up the stern ramp and on to the deck where it is emptied into stalls. From here the fish is skidded directly to the ship's two raw product bunkers. For short-time preservation of the fish, two ice generators are installed in connection with the fish stalls which, from seawater, can produce a

of raw products per day. In the treatment of cod, the liver is separated from the entrails and is processed into medicinal oil in a special liver-oil plant. Two fresh-water generators with a capacity of 20 tons per day take care of the fresh-water supply. (Fisheries Attaché, United States Embassy, Copenhagen, June 19, 1962.)



Ecuador

COASTAL FISHING PROBLEMS BEING STUDIED:

A delegation from the Province of Manabi met with Ecuador's Minister of Development early in July concerning economic problems of the Province, including coastal fishing problems. The following account of statements made by the Minister with respect to fishing is taken from the Quito daily El Comercio of June 29, 1962.

The Minister referred to fishing as one of the activities with greatest possibilities in the Province of Manabi and stated that the Ministry of Development was preparing a program for the promotion of fishing which was national in scope but with greatest emphasis in the Province of Manabi. The program includes technological help to the individual fisherman. The Minister commented that Ecuador has a large domestic market for fish consumption which has not been sufficiently developed because of transport difficulties and an inadequate distribution system. The Ministry of Development, he added, is planning with the Ministry of Economy the installation of freezing plants to help this situation. The program also would assist the fishermen grouped together in associations to improve their equipment so that they would be more nearly able to compete with foreign fishermen fishing in Ecuadorian waters. He referred to the necessity of converting the Ecuadorian fishing fleet to the purse-seiner system.

The Minister also stated that final details were being completed for the establishment of a mixed Japanese-Ecuadorian company which would establish freezing plants for the export and canning of tuna and other fish. Representatives of the Japanese company, according to the Minister, were scheduled to arrive in Ecuador on July 6, 1962. (United States Embassy report, Quito, July 11, 1962.)

MANTA TUNA FISHERY:

Purse seiners were prohibited from fishing within 40 marine miles of the Ecuadorian coast between Cabo Pasado and Punta de Santa Elena by the Government of Ecuador on May 31, 1962. One of the objectives of the ban on purse-seine fishing was to protect the local bait-boat tuna fishery at Manta.

The Manta fishing fleet consists of two types of vessels, a canoe fleet that fishes nearby waters, mainly for the local fresh market, and a fleet of tuna boats. While the catch of the canoe fleet includes some skipjack tuna, their production is of no consequence to the cannery at Manta. The tuna fleet at Manta consists of 32 bait boats, ranging in carrying capacity from 5 to 55 tons. Propulsion is by Diesel engines averaging about 135 horsepower, but ranging up to at least 180 horsepower. Their speed is about 8-10 knots. Crew size varies from 15 to 25, which (if an estimated average of 20 is used) suggests that the total number of bait-boat fishermen in Manta is about 640.

The Manta bait-boat fleet is locally built and new. According to representatives of the tuna cannery at Manta, their company began to provide interest-free loans for tuna vessel construction in 1958. Since then the local bait-boat fleet has been built on the beach nearby. At present, the fleet fishing capacity is sufficient to supply the cannery for a substantial part of the year, and the construction of additional vessels is not being encouraged. The local fishing skippers, who received loans from the cannery, have become land-based managing owners, according to the company. A part of the daily catch is used to retire the loan on each vessel. The amount subtracted for this purpose varies with the catch (from zero for catches less than 5 tons to 25 percent for catches over 25 tons). In the Manta fleet the crew share is about 40 percent and the vessel share 60 percent.

The superstructure of the Manta bait boat is centered forward of midships and the pilot-house is well forward. Bait tanks are located in the space aft of the cabin. Racks are used during fishing. The vessels are not refrigerated, the catch being protected from the heat with damp cloths.

Fishing trips are usually completed in a day. The fishing operation begins shortly after midnight. The vessels take a position along the beach in the harbor and hang out lights to attract the local bait species. Around 4:00 or 5:00 a.m. a net is used to catch the bait fish needed for the day. About 5:30 a.m. the fleet departs for the fishing grounds, the closest of which are about an hour's run.

The seasonal availability of tuna in Manta waters is not fully understood. Skipjack tuna

Ecuador (Contd.):

are by far the most abundant species. They are usually taken during the period extending from April or May to August or September. But in 1961, skipjack catches fell off in August and September and then improved with good fishing lasting until December. In 1962, good catches of skipjack were not made until May, whereas in 1961, good fishing began in April.

It is common for the cannery to can frozen fish at the start of the day before any landings have been made.

Skipjack tuna is packed in several styles and can sizes at Manta. The company produces a four-pound solid pack, a one-pound tall chunk style pack, a one-half pound solid pack, and a one-half pound grated pack. Brine or oil is added to the pack, depending on the style of the pack and the intended market. A



A general view of the Port of Manta.

The cannery plant in Manta has a cold-storage capacity of about 2,000 tons. Two California-type bait boats of Panamanian registry have recently been brought to Manta, and these provide an additional 250 tons of frozen storage capacity. Under ideal conditions, the daily freezing capacity of the plant, as of May 1962, was about 150 tons. The canning capacity is 50 tons per day. Additional construction is under way to make sure that the cited maximum tonnages of freezing and canning capacity can be attained under average conditions.

When fishing is very good, the existing fleet can bring in more fish than can be canned or refrigerated. Thus, during May, June, and July, it is common for the boats to be on limits.

The catch is unloaded offshore. The fish are first transferred to large dugout canoes which carry the catch about 100 yards to the beach. Then the fish are loaded on trucks and hauled to the plant. At the cannery the fish are processed almost immediately or are frozen for processing at another time.

significant amount of tuna is sold in Ecuador. Local sales have tripled since 1960. The cannery employs about 320 people. All are Ecuadorians except the general manager, plant manager, and fleet manager.

While the cannery and fishing operations appear to be contributing significantly to the economy of Manta, problems exist. One problem involves relations between Ecuadorian and foreign fishermen. The friction between fishermen was partly due to the scarcity of fish during the off-season. Since, in 1962, skipjack were not available to the local bait-boat fishery until a month later than in 1961, the Ecuadorians believed that fishing by purse seiners was driving the fish down where they were inaccessible to the local bait boats. By late May 1962 the situation had changed. Only 2 or 3 large purse seiners were in nearby high-seas waters at that time and the catch by local bait boats was excellent.

The fact that skipjack are only seasonally available in local waters causes economic hardship among bait-boat fishermen. Skipjack is the only local species that can be

Ecuador (Contd.):

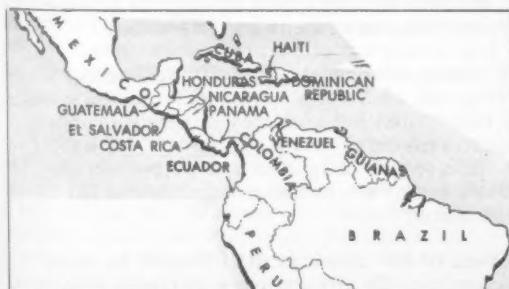
marketed in quantity at present by the bait boats. The ocean offshore from Manta is reportedly rich in marine life, and a variety of species is taken by the canoe and tuna fleets when there is a market for the catch. It may be possible to can and market species other than tuna. A "blue mackerel" seems to have the greatest potential. It appears likely that the market for low-priced canned fish would be mainly in Ecuador and nearby countries.

Fish are a popular food in Manta. It has been reported that crowds of people are on hand when boats land, and that afterwards, hundreds of fish are hand-carried to Manta homes.

Note: See Commercial Fisheries Review, Aug. 1962 pp. 25 and 61; June 1961 p. 57.

**El Salvador****FISHERIES TRENDS,
SECOND QUARTER 1962:**

Tuna Resources: Studies by the Inter-American Tropical Tuna Commission and the Food and Agriculture Organization (FAO) indicate a considerable amount of tuna near the Salvadoran coast. The Government of El Salvador was expected to license a vessel to fish yellowfin tuna on an experimental basis. The Ministry of Economy of El Salvador had received five license applications to fish for tuna as of July 1962. Several vessels originally purchased for shrimp fishing may be used for tuna fishing. The Government of El Salvador is encouraging local and foreign investments in freezing and canning facilities.



Spiny Lobster Fishery Promising: Significant catches of spiny lobster were reported during the second quarter of 1962. Lobstermen are seeking means to export their prod-

uct. (United States Embassy, San Salvador, July 24, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 64.

**Fiji Islands****JAPANESE FISHERIES AGENCY
POSTPONES DECISION ON FIJI
ISLANDS TUNA BASE:**

The Japanese Fisheries Agency is reported to have postponed approval of the application submitted by the South Pacific Ocean Fisheries Cooperative Association to establish a tuna base at Levuka, Fiji Islands, in cooperation with a British fishing and cannery company. The Fisheries Agency is said to have taken this action since the Cooperative Association does not possess licensed tuna vessels; consequently, approval of the proposed venture would be meaningless. The Agency is reported to have instructed the Cooperative Association to submit a more detailed report of its business plan, but the Association is withholding its reply to this instruction because it feels that it cannot prepare a detailed plan until such time that the Agency formally clarifies its position regarding the licensing of additional tuna vessels totaling 20,000 gross tons.

The Association had submitted on April 25 of this year its application to establish a tuna base at Levuka. Under the automatic approval clause of the Fisheries Cooperative Association Law, an application is automatically approved if the Fisheries Agency does not act on it within two months of its submission date. Thus, the application submitted by the Cooperative would have been automatically approved on June 24. However, to temporarily halt the application of the clause, the Agency on June 17 applied another provision within the same law which requires applicants to state in clear detail their operational plans. (Suisan Keizai Shimbun, June 28, 1962.)

**France****UNITED STATES QUALITY
CERTIFICATION OF FRESH OR
FROZEN SCALLOPS ACCEPTED:**

In response to a Government request, the French market has recently been opened to

France (Contd.):

United States exports of fresh and frozen scallops.

The French Institut Scientifique et Technique des Peches Maritimes, decided in June 1962, to recognize the U.S. Department of the Interior's "Certification of Quality and Condition" for scallops as a certificate of wholesomeness. This was considered sufficient sanitary documentation for the importation into France of United States-produced fresh or frozen scallops for immediate consumption. The phrase, "immediate consumption" is interpreted to preclude any further processing in France from the fresh or frozen condition, such as canning, etc.

Under French regulations such certificates, signed by a recognized authority, must accompany shipments of scallops to France.

Imports of scallops into France are free from quantitative restrictions and import licensing. The import duty is low--9 percent ad valorem on c.i.f. (cost, insurance, and freight) value--and additional import taxes are negligible.

The prospects for the sale of scallops in France are good. Domestic production does not satisfy the demand, particularly for frozen scallops, and there is an active interest in importing them from the United States.

The Certificate of Quality and Condition which must accompany each shipment may be obtained from the Regional Director of the U.S. Bureau of Commercial Fisheries. Applications from the New England area, for example, should be sent to the Regional Office at Gloucester, Mass. (United States Embassy, Paris, June 20, 1962; International Commerce, August 13, 1962.)

Note: The names of French importers of fish and seafood are available in a Commercial Intelligence Division trade list titled Provisions--Importers and Dealers, France, which may be purchased for \$1.00 from U. S. Department of Commerce field offices. The relative size of each firm, products handled, and size of sales force are indicated in the listings.

**Greece****FREEZER-TRAWLER LANDINGS,
JANUARY-JUNE 1962:**

In the first half of 1962, freezer-trawler landings in Greece totaled 7,481 tons, an in-

crease of 15.3 percent over the 6,488 tons landed in the same period of the previous year. It had been predicted that landings by the freezer-trawler vessels would reach 8,500 tons in the first half of 1962. Landings did not match expectations because of a prolonged decline in the catch from the Mauretania fishing grounds.

Although freezer-trawler landings increased in Greece in 1962, the increase was not as large as was expected. In June 1962, 6 vessels landed 1,850 metric tons of frozen fish as compared with landings of 1,252 tons by 3 vessels in the previous month. In June 1961, 3 vessels landed 687 tons of frozen fish. (Alieia, July 1962.)

**Greenland****SHRIMP INDUSTRY:**

Greenland is planning to increase shrimp output, particularly for export markets. In 1961, the shrimp production, supervised and marketed by the Royal Greenland Trading Company (with offices in Copenhagen), amounted to over three million cans, vacuum-packed bags, and jars. An additional 125 tons of frozen shrimp in bulk were exported also. Although much of the shrimp for canning is peeled by hand, shrimp-peeling machines are in use. Machine-peeled shrimp have a considerable sale in the United States, while France prefers a specialty pack of frozen unpeeled shrimp.

From May to November, as the ice barrier of the Arctic Sea withdraws under the Midnight Sun, small shrimp boats leave the towns around Disko Bay on the west coast of Greenland to fish the shrimp area that biologists have determined as the richest ever found.

Fishing is done at about 200 fathoms. The shrimp are red when removed from the water. The fishermen seldom stay out long in these dangerous waters; they return to port each day. The catch is landed and delivered to modern factories in the coastal towns for processing.

Much of the catch is still peeled by hand for canning. On the average, a Greenlander woman can peel about $4\frac{1}{2}$ pounds of cooked shrimp an hour, but in some plants, machines have replaced the hand peelers. The machines

Greenland (Contd.):

can peel about 650 pounds an hour. (The Fishing News, June 15, 1962.)

Note: See Commercial Fisheries Review, July 1962 p. 64.



Iceland

FISHERIES TRENDS,
JANUARY-JULY 1962:

Landings: All species of fish landed by Icelandic vessels in the first four months of 1962 totaled 193,399 tons as compared with 185,943 tons in the same period of the previous year. The increase in the herring catch was partly offset by a decline of 6,000 tons in groundfish landings. The decline in groundfish landings was due to a drop in landings by the trawler fleet.

Trawler Fishery: The trawlers had poor catches early in the year and then on March 10 they stopped fishing because of a dispute between the trawler seamen's union and vessel owners over wages and terms. The dispute was settled on July 18, but the trawlers were slow to resume fishing. By August 2, only 9 trawlers were fishing. An additional 4 or 5 trawlers were transporting herring.

Iceland's own trawlers were excluded from certain inshore fishing grounds when Iceland extended her fishing limits to 12 miles. Since then the trawlers have operated at a loss. The Government recently passed a bill that will provide about 60 million kroner (US\$1.4 million) to help compensate trawlers for their losses in 1960 and 1961. The money will come partially from the existing fisheries catch guarantee fund, which is financed by export levies placed on the motorboats as well as the trawlers, and the balance (about half) is matched by the Treasury.

Trawler Dispute Settled: Employers and seamen on July 18 approved the wages and terms agreement made by their representatives on July 5. Seamen will improve their earnings from the share-of-the-catch under the terms of the new agreement. The Chairman of the Seamen's Federation described the increase as "20-21 percent, provided that half of the catch is for the domestic market and the other half for the foreign market." Reports of good catches of cod and haddock off Greenland's east coast had exerted pressure for settlement of the dispute.

Even though the trawlers were free to go to sea on July 19, other problems were to delay their sailing. Only part of the fleet had been fitted out at that time. The press reported that trawler officers were negotiating with owners for better wages and terms. Also, the question of what additional government assistance the trawlers may receive had not yet been settled satisfactorily from the owner's viewpoint. The trawler strike was marked by a sharp controversy over the possibility of allowing Icelandic trawlers to conduct more extensive fishing within the 12-mile fishing limits off the Icelandic coast. At a July 5 meeting of the Reykjavik City Council, the Mayor (supported by Independent and Social Democratic Party members) spoke in favor of such trawler relief. The Progressive Party members pointed out that such steps would greatly endanger both the operations and catch of the smaller motor fishing vessels, and might prompt foreign countries to demand similar rights for their trawlers.

Herring Fishery: An excellent winter herring catch off the southwest coast of Iceland was followed by record landings from the summer herring fishery off the north coast. Winter herring landings in the first 4 months of 1962 amounted to 41,080 metric tons, a gain of 52.0 percent over landings of 27,027 tons during the same period in 1961. The summer herring season was delayed this year until June 24 by a dispute between fishermen and vessel owners over division of the proceeds of the catch. But by July 22, the summer herring catch amounted to 114,264 tons, a gain of 6.7 percent over the catch of 107,055 tons by the same date last year. The improvement in herring catches in the last two years was partly due to the use of more efficient equipment by part of the herring fleet. Some vessels added sonar to locate schools of fish, and power gear to haul loaded nets.

North Coast Herring Season: By mid-June 1962 fishing vessel owners and fishermen were still in disagreement over division of the herring catch. Because it was feared the start of the Icelandic north coast herring season might be further delayed, a Provisional Decree was issued by Iceland's President on June 24, making it possible for the fleet of about 240 herring vessels to put out to sea. The vessels moved promptly to the herring runs off the north coast and caught moderate quantities of what was considered good fat fish. Herring had moved close to shore and even into the fjords this summer. By July 1, a total of 14,518 metric tons was

Iceland (Contd.):

caught as compared with 21,307 tons by the same date the previous year when there was no delay in the start of the fishery. A total of 65,612 metric tons of herring had been landed by July 15, 1962, as compared with landings of 77,424 tons by the same date last year. The catch in 1961 was the largest since 1944. This year's catch consists of good quality herring, and salting proceeded normally.

The Provisional Decree was hailed by the Social Democratic and Independence Party press, but was denounced by the Central Board of IFL as "violation by State power of the basic rights of labor unions." Timmin, a newspaper, reflecting the views of the Progressive Party, charged that the Government was acting too late.

Since the Icelandic State Mediator believed that further negotiations between both parties involved in "share-of-catch" dispute was futile and since no agreement was reached before July 10, 1962, an Arbitration Board (with a majority of its members chosen by the Supreme Court) was appointed to decide the question.

Herring Dispute Settled: The Arbitration Board decided the herring dispute. Crews of boats equipped with Asdic finders and power haulage systems were awarded 34.5 to 35.5 percent of the value of the catch depending on the size of boat. The old contract, giving 40 percent of the catch value to crew members, will remain in force for boats without such equipment (about one-third of the fleet). The minimum monthly wage, payable in case of a poor catch was raised from 5,365 kroner (US\$125) to 6,610 kroner (US\$154). Each seaman gets a free 200,000 kroner (US\$4,657) life insurance policy, and 1 percent of the value of the catch goes into a medical aid fund for seamen.

Salted Herring: Herring salting began on July 4, with the fat content fixed at about 20 percent. In 1961, salting started on June 19. A total of 8,255 tons had been salted by July 15, 1962. Prices received for salted herring in June were higher than in 1961, and the United States figured substantially in sales for the first time in a number of years. Negotiations were continued with the Soviet Union, which bought 40,000 more barrels than the 120,000 barrels of salted herring called for in the trade protocol during 1961. The

Soviets wished to decrease correspondingly the amount purchased in 1962. As of July 27, the Soviet Union had not renewed its contract to buy salted herring from Iceland.

The Herring Production Board concluded some contracts for the prospective north shore herring catch as follows: for salted herring, 165,000 barrels to Sweden and Finland, and 11,000 barrels to the United States.

Herring Meal: Prices for herring meal at 16 to 18 shillings (\$2.248 to \$2.529) per unit of protein were fairly good, but herring oil prices were not considered good. By July 15, a total of 55,826 tons of herring had been sold to reduction plants. About 92,761 tons of the herring catch to July 22, 1962, was used for meal and oil as compared to 62,727 tons used for meal and oil by the same date last year. The export price for herring oil in July 1962 was £37.1 per metric ton (4.7 U.S. cents per pound). In July 1961, export prices for Iceland herring oil ranged as high as £70.0 per metric ton (8.9 U.S. cents per pound). The decline in herring oil prices was due to severe competition from Peruvian anchovy oil, United States menhaden oil, and vegetable oils. Contracts made by the Herring Production Board for herring meal and oil amounted to about 148 million kroner (\$3.4 million)--about 14,000 metric tons of meal and 11,000 tons of oil.

Production and Marketing: The value of frozen fillets exported during the first five months of 1962 was 55 percent greater than in the same period of 1961 and accounted for 30 percent of the value of Iceland's total exports. Early in 1962 the U.S.S.R. contracted to buy 13,000 metric tons of frozen cod and 5,000 tons of frozen perch during 1962, for £145 per ton (18.4 U.S. cents per pound). Iceland sold frozen fish to the Soviet Union in 1961 for £128 per ton (16.3 U.S. cents per pound). Although the fish could probably have been sold to the Western countries, the contracts were made at a time when the Freezing Plants Corporation was having difficulty in making prompt payments to its members from sales in the United States. Later the Freezing Plants Corporation and Samband, the other major frozen fish exporter, received working credits of US\$4 million from two New York City banks. The credits enabled them to make prompt payments for fish sold in the United States. The Freezing Plants Corporation has reorganized its sales organization in order to increase its sales of frozen fish to the Western countries. A new frozen fish

Iceland (Contd.):

exporter, Atlantor Ltd., entered the frozen fish export business with five freezing plants at the beginning of 1962. It has been successful in selling all its frozen fish to Great Britain and the United States and in making prompt payments to its member plants.

In order to take advantage of the vast fish market developing in Africa, the Ministry of Foreign Affairs is planning to send a commercial representative to Nigeria. This area has long provided Iceland with a market for stockfish. The spread of refrigeration equipment in the more developed countries of Africa has caused this area to be considered as a potential market for frozen fish exports. Iceland would welcome an additional market for its fish, especially if it does not reach a favorable arrangement with the European Common Market.

Whaling: Iceland was enjoying a record whaling catch this season. On June 27, the Icelandic State Radio announced that 137 whales had been caught compared with 87 by the same time in 1961. From May 20, the opening of the season, until July 26, a total of 269 whales were caught as compared to 165 for the same period in 1961. But the price of whale oil slipped to £45 per long ton (5.6 U.S. cents per pound) in July 1962, down 38.5 percent from the price in 1961 of £73.1 per ton (9.1 U.S. cents per pound).

Soviet Research Vessels: Two Soviet oceanographic research vessels arrived in Reykjavik on July 13, 1962. The newspaper Morgunbladid said that the Foreign Office had allowed the vessels to enter to take on water and provisions. (United States Embassy, Reykjavik, July 13, 20, 27, and August 3, 1962.)

EXPORTS OF FISHERY PRODUCTS, JANUARY-MAY 1962:

During January-May 1962, there was a considerable increase in exports of frozen herring, frozen fish fillets, salted herring, herring oil, and herring meal as compared with the same period in 1961, according to the Statistical Bureau of Iceland's Statistical Bulletin, June 1962. Exports of fish meal and ocean perch meal showed a considerable decrease in the first five months of 1962.

Icelandic Fishery Exports, January-May 1962 with Comparisons

Product	Jan.-May 1962			Jan.-May 1961		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
		Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.
Salted fish, dried	1,215	24,053	558	2,321	44,205	1,158
Salted fish, uncured	14,043	172,356	3,999	11,364	113,954	2,986
Wings, salted	735	8,481	197	1,303	11,108	291
Stockfish	4,213	108,576	2,519	5,093	117,611	3,081
Herring on ice	4,828	16,895	392	3,754	9,630	232
Other fish on ice	12,864	58,339	1,353	13,984	58,065	1,521
Herring, frozen	11,680	60,942	1,414	7,926	30,208	1,027
Other frozen fish, whole	851	11,027	256	672	6,995	183
Frozen fish fillets	26,611	456,084	10,581	17,127	259,981	6,812
Shrimp and lobster, frozen	83	7,446	16	178	12,404	327
Roses, frozen	592	11,149	261	472	6,629	159
Canned fish	87	5,797	134	110	7,127	187
Cod-liver oil	1,813	14,499	336	1,873	14,975	302
Lumpfish roes, salted	246	3,686	86	332	5,518	145
Other roses for food, salted	2,709	37,428	968	2,321	23,403	613
Roses for bait, salted	304	2,064	48	194	1,327	35
Herring, salted	16,609	149,427	3,467	7,668	57,912	1,517
Herring oil	17,823	76,865	1,783	4,293	22,944	601
Ocean perch oil	15	59	1	196	1,109	39
Whale oil	388	2,558	59	-	-	-
Fish meal	12,641	78,305	1,817	20,765	79,058	2,071
Herring meal	18,616	116,326	2,689	9,088	37,962	995
Ocean perch meal	34	204	5	1,555	5,382	140
Wastes of fish, frozen	1,818	4,505	105	3,947	7,610	199
Liver meal	170	1,119	26	175	936	25
Lobster and shrimp meal	-	-	-	194	376	10
Whale meal	302	1,567	36	305	1,025	27
Whale meat, frozen	151	1,087	25	292	1,965	51

Note: Values converted at rate of 1 kronur equals 2.32 U.S. cents in 1962 and 2.62 U.S. cents in 1961.

ICELANDIC PRODUCTION OF PROCESSED FISHERY PRODUCTS AND BYPRODUCTS, 1960-61:

Product	1961			1960		
	Qty.	Value		Qty.	Value	
		1,000 Metric Tons	Million Kronur	1,000 Metric Tons	Million Kronur	US\$ 1,000
<u>Frozen:</u>						
Fish paste	48.5	802.9	19,751	58.8	962.6	23,220
Fish paste	4.0	16.2	401	10.8	19.3	508
Herring	18.8	2,147	526	20.9	321	1,372
Fish roe	0.7	10.2	251	0.7	9.4	246
Shrimp and lobster	0.8	54.2	1,333	0.4	40.8	1,064
Total Frozen	77.0	883.2	24,187	78.5	1,084.3	28,408
<u>Cured:</u>						
Salt fish, dried	2.5	51.3	1,262	5.5	109.9	2,879
Salt fish, wet	24.6	291.2	6,811	22.7	230.0	6,076
Stockfish	0.1	5.0	1,153	0.4	241.7	6,333
Herring, salted	49.4	469.0	12,206	21.7	225.2	5,603
Fish roe	4.4	47.5	1,168	0.4	3.1	82
Other	1.8	15.6	384	0.4	2.7	71
Total Cured	90.8	1,097.4	26,096	64.1	615.1	21,356
<u>Canned:</u>						
Fish	0.4	12.8	315	0.5	18.4	482
Shrimp	1/	4.8	118	-	5.7	149
Total Canned	0.4	17.6	433	0.5	24.1	631
<u>Byproducts:</u>						
Meal:						
Herring	43.6	344.1	6,005	19.5	85.3	3,338
Ocean perch	4.6	22.1	544	10.1	37.3	877
Lobster	0.2	0.5	12	0.2	0.1	2
Liver	0.3	2.2	54	0.4	2.7	71
Other	18.6	81.5	1,987	23.4	91.9	2,400
Oil:						
Ocean perch	1.2	6.2	153	2.3	13.5	354
Herring	38.1	190.1	4,676	18.2	106.8	2,801
Cod-liver	6.0	50.5	1,242	10.5	71.0	1,860
Solubles (50% solids)	2.9	4.9	121	1.2	2.3	60
Total Byproducts	117.4	901.8	14,804	85.8	411.0	10,768
<u>Miscellaneous:</u>						
Fish landed abroad on ice	35.9	304.6	5,033	38.1	127.1	3,330
Fresh-water fish	6.3	35.4	871	6.7	45.0	1,281
Home consumption	17.3	65.7	1,816	17.0	63.4	1,681
Trimmings	0.2	1.5	37	-	-	-
Total Misc.	63.7	307.2	7,337	52.8	239.4	6,272
Grand Total	2,950.3	3,607.8	73,977	382.7	2,573.8	67,436

Includes 27 tons of codfish in 1961 and 60 tons in 1960.

Does not include whole products or bottoms meat, 1,354 tons oil, 1,064 trim, meal, 1,604 tons, and other 573 tons.

Values converted at rate of 1 kronur equals 2.48 U.S. cents in 1961 and 2.62 U.S. cents in 1960.

Iceland (Contd.):

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-APRIL 1962:

Species	January-April	
	1962	1961
	(Metric Tons) ¹	
Cod	115,009	120,943
Haddock	13,436	14,057
Saithe	5,020	3,276
Ling	3,755	2,743
Wolfish (catfish)	7,142	7,328
Cusk	3,285	3,129
Ocean perch	2,585	5,265
Halibut	450	478
Herring	41,080	27,028
Shrimp	309	430
Other	1,328	1,266
Total	193,399	185,943

1/Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS JANUARY-APRIL 1962:

How Utilized	January-April	
	1962	1961
	(Metric Tons)	
Herring¹ for:		
Oil and meal	22,862	11,089
Freezing	9,592	6,758
Salting	3,182	6,038
Fresh on ice	5,375	3,143
Canning	69	-
Groundfish² for:		
Fresh on ice landed abroad	12,278	10,617
Freezing and filleting	65,386	66,203
Salting	47,122	45,480
Stockfish (dried unsalted)	22,969	32,385
Home consumption	3,427	2,690
Oil and meal	828	1,110
Shrimp for:		
Freezing	230	304
Canning	79	126
Total production	193,399	185,943

1/Whole fish.
2/Drawn fish.

Indonesia



SOVIET TECHNICIANS PLAN CONSTRUCTION OF OCEANOGRAPHIC SCHOOL:

Soviet technicians this summer arrived in Ambon, Indonesia, to begin planning for construction of an oceanographic school. Housing for Russian and Indonesian workers is being built. Construction materials and equipment to build the school was expected to arrive in September. (United States Consulate Surabaya, July 5, 1962.)



Iran

STATUS OF FISHING INDUSTRY:

Iran's fishing industry is one of that country's minor industries, employing some 12,000 persons. It is to a great extent carried on by independent fishermen and fishing enterprises who use primitive fishing equipment and techniques. Iran's annual fish and shellfish catch is estimated at from 20,000 to 25,000 metric tons. The most important fish species caught in the Caspian Sea are sturgeon, white salmon, white fish, carp, bream, pike, catfish, and herring. Species caught in the Persian Gulf include sardines, tuna, bream, snappers, mackerel, and shrimp.

Iran is a major source of the world's caviar supply. Its caviar production during fiscal year 1957/58 (March 21, 1957, through March 20, 1958) was 162.5 metric tons as compared with 126.5 tons the previous year. Iran's exports of "caviar and caviar-like" products in 1958-59 totaled 159 tons valued at 160.9 million rials (US\$2.1 million), including U.S.S.R. 55 tons; France 39; United States 36; and Germany, 11 tons.

The most important fisheries enterprise in Iran is the Iranian Fisheries Company (Sherkat Sahami Shilat Iran), a Government agency. It was established in 1952 after the termination of the Iran-U. S. S. R. Fishing Company and has its headquarters at Tehran. Its main installations are at Bandar Pahlevi, a port city on the Caspian Sea. Until 1961, its authority was limited to the Caspian Sea and northern rivers fisheries, but in 1961, the Iranian Fisheries Company was granted jurisdiction over the Persian Gulf Fisheries.

The exploitation of fishery resources in the Persian Gulf began about 1955 with the organization of a joint venture between the Iranian Government and a Japanese company. That arrangement was subsequently terminated. As of May 1962, the Iranian Fisheries Company was seeking to establish a joint fisheries operation in the Persian Gulf with a foreign firm.

The shrimp fishery in the Gulf of Persia was substantially developed by a joint United States-Iranian company in 1958. (Economic Reports Part I, No. 62-48, U. S. Dept. of Commerce, May 1962).

Note: Value converted at rate of 75.75 rials equal US\$1.00.



Italy

FROZEN TUNA EXPORTED TO ITALY DIRECTLY FROM JAPAN:

A Japanese fishing firm is reported to have concluded a contract to export 148 metric tons of frozen yellowfin tuna to Italy from Japan proper at a c.i.f. price of \$380 per metric ton. Reportedly, this provides a very small margin of profit since about \$87 would have to be deducted for transportation expenses and brokerage fees.

In February this year, another Japanese fishing company exported a small quantity of frozen tuna from Japan proper to Europe. But the recent contract to export frozen yellowfin tuna to Italy is the first case of frozen tuna being exported from Japan proper to any European or African country in fiscal year 1962 (April 1962-March 1963). A third Japanese firm is reported to be negotiating a contract to export around 100 metric tons of frozen tuna to Italy, which it hoped to conclude by the end of July.

Practically all frozen tuna and tuna-like fish exported by Japan to Europe and Africa have been Atlantic-caught fish transshipped from Atlantic Ocean tuna bases. Frozen tuna were not exported from Japan proper to Europe and Africa in the past because of the high cost of transportation and also because of the high demand for the product in the United States, to the extent that the Japanese exporters were even transshipping much of the Atlantic-caught frozen tuna to the United States. However, exports of frozen tuna to the United States have recently begun to decline, whereas demand in Italy is firm. Therefore, it appears that frozen tuna exports from Japan proper to Europe and North Africa may likely increase hereafter, particularly since tuna catches in the Atlantic Ocean are reported to be declining.

Exports of frozen tuna to Italy during the first three months of the current fiscal year reportedly total approximately 6,000 metric tons. In fiscal year 1961, a total of 30,000 metric tons is reported to have been exported to Italy. (Suisan Keizai Shimbun, July 22, 1962.)

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INCREASE IN FROZEN TUNA IMPORT QUOTA REQUESTED:

According to reports received by the Japanese frozen tuna industry, the Italian Gov-

ernment has agreed to seek an increase of 15,000 metric tons in the duty-free import quota for frozen tuna, as requested by the Italian tuna packers. It plans to submit a request to the Common Market. This increase, if granted, would raise Italy's total duty-free import quota of frozen tuna from 25,000 metric tons to 40,000 metric tons.

The present 25,000-ton frozen tuna import quota for Italy was originally believed to have been established under pressure from France and other Common Market nations, but recent reports indicate that pressure from within Italy, particularly from Italian beef producers, had also played an important part in setting that quota. Therefore, if the Italian Government decides to increase the present tuna import quota, it is believed that its decision may likely be accepted by the Secretariat of the Common Market.

Japan annually exports between 25,000 to 30,000 metric tons of frozen tuna to Italy. Under the present 25,000-ton import quota for Italy set by the Common Market, Japanese frozen tuna exports to Italy are limited to 14,000 metric tons. Imports (for canning) exceeding that amount are dutiable at 7.5 percent ad valorem. Establishment of a 40,000-ton quota would mean that Japanese tuna producers would be able to increase their duty-free exports to Italy. (Suisan Tsushin, July 24; Suisan Keizai Shimbun, April 10, 1962.)

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FISHERY COOPERATIVES HAVE INFLUENTIAL ROLE IN ITALIAN FISHING INDUSTRY:

There are about 450 fishery cooperatives in Italy as compared with some 100 in the United States. The membership in the Italian organizations is about 120,000 or almost as many as all full-time and part-time fishermen in the United States.

Italian fishery cooperatives have functions beyond those of United States cooperatives. They manage wholesale fish markets in some areas, and even regulate fishing in territorial waters over which the government has assigned them jurisdiction. Italian fishermen's cooperatives are also involved in governmental assistance to fishermen in the form of family allowances, insurance benefits, and medical assistance.



Japan**CANNED TUNA IN BRINE SALES
TO UNITED STATES:**

The eighth sale to the United States of canned tuna in brine was approved at a July 20, 1962, meeting of the Tuna Sales Standing Committee, Japan Canned Foods Exporters Association. The Committee approved the sale of 250,000 cases, consisting of both white meat and light meat tuna, offered by the Canned Tuna Joint Sales Company which represents the packers. The Committee also approved a 20 cent per case increase for white meat tuna. Deliveries are to be completed by September 23, 1962.

Sale of Canned Tuna in Brine to U.S.		
Species	No. Cases	Price Per Case
	48 No. 3, 7-oz. Cans	F.o.b. Japan
Tuna:		
White meat	150,000	US\$10.40
Light meat	100,000	7.80
Total	250,000	

Japanese export sales of canned tuna in brine up to and including the eighth sale total 1,743,000 cases, consisting of 968,000 cases of white meat tuna and 775,000 cases of light meat tuna.

The joint Sales Company reported as of July 1962 stocks of 500,000 cases each of canned white meat tuna and canned light meat tuna, a total of one million cases. (Suisan Tsushin, July 21, 1962.)

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**EXPORTS TO U. S. OF
CANNED TUNA IN BRINE, 1961:**

Japan's exports to the United States of canned tuna in brine during January-December 1961 amounted to 2,218,857 standard cases (48 7-oz. cans), a 9-percent increase from the previous year's exports of 2,035,195 cases. The 1961 exports were up 74.3 percent for canned white meat tuna, but were down 51.8 percent for light meat, as compared with the previous year.

Japanese Export to the U.S. of Canned Tuna in Brine, 1956-61			
Year	White Meat	Light Meat	Total
. . (Standard Case - 48 7-oz. Cans) . .			
1961	1,711,607	507,250	2,218,857
1960	981,761	1,053,434	2,035,195
1959	1,004,824	1,058,422	2,063,246
1958	1,312,265	799,914	2,112,179
1957	1,166,111	563,748	1,876,013
1956	1,010,378	677,434	1,677,812

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**CANNERS CONSIDER INCREASE
OF CANNED WHITE MEAT
TUNA EXPORT PRICES:**

The Japan Export Tuna Packers Association was scheduled to hold a directors meeting on July 19, 1962, with discussions likely to center around the July sales of canned tuna. The discussion was to be concerned particularly with the problem of raising the export price of white meat tuna in brine. The early July 1962 price of white meat tuna was \$10.20 per standard case, f.o.b. Japan, but some of the canners were expected to urge a price increase of \$1 per case.

Reportedly, the price increase is being sought since the packers have had to pay high ex-vessel prices for summer albacore this year, with prices averaging 160 yen per kilogram (US\$403 a short ton), and also because of the low stocks of canned white meat tuna held on consignment by the Canned Tuna Sales Company. In addition, large-scale production of canned white meat tuna is not expected until the winter albacore season arrives. (Suisan Tsushin, July 14, 1962.)

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**SHIZUOKA PACKERS CAN
SKIPJACK TUNA FOR U. S.:**

Shizuoka Prefecture packers in July were concentrating on packing skipjack tuna for export to the United States. Some of them had been canning tuna in oil, using small skipjack costing around US\$162 per ton. Judging from prices received for light meat (skipjack) in oil to Europe, it was believed it would be more profitable if less than \$125 per ton was paid for small skipjack. Production of tuna in oil was expected to be stepped up after the end of July. (Suisan Tsushin, July 5, 1962.)

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**SKIPJACK TUNA EX-VESSEL PRICES
MAKE CANNING UNPROFITABLE:**

Heavy landings of very small skipjack tuna continued in late July 1962. Because of the small size of the tuna, the ex-vessel price of about 55 yen a kilogram (\$152 a metric ton) in Sanriku District barely allowed tuna canners to recover their packing costs. The higher ex-vessel skipjack price of about 60 yen a kilogram (\$166 a metric ton) in Shizuoka Prefecture was also described as unsatisfactory by canners.

Packers in the Sanriku District were concentrating on packing tuna in oil for export to

Japan (Contd.):

Europe because they had almost finished their tuna pack for export to the United States. (Japanese periodical, August 3, 1962.)

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ALBACORE AND YELLOWFIN TUNA PRICES FOR EXPORTS TO UNITED STATES:

Yellowfin tuna fishing in the Eastern Pacific as of July 1962 was still light, reports the Japanese periodical *Suisan Keizai Shim bun* of July 16, 1962. Also, the United States landings of albacore tuna in the 1961 season did not meet the demand by United States canners. The periodical explains that accelerated buying of frozen tuna in Japan by United States packers during the last half of 1961 caused Japanese export prices for frozen tuna to rise.

Japanese Average f.o.b. Prices for Licensed Frozen Tuna Exports to United States by Months						
Month	Albacore (Round)		Yellowfin (Gilled and Gutted)			Quantity Short Tons
	1962	1961	1962 (US\$/Short Ton)	1961	1960	
January	379	278	1/	330	248	1/
February	360	281	1/	322	259	1/
March	362	281	1/	340	259	1/
April	365	297	1/	340	260	1/
May	374	300	1/	348	264	1/
June	1/	315	296	2/350	266	257
July	1/	322	309	1/	265	259
August	1/	340	312	1/	271	246
September	-	356	283	-	288	239
October	-	376	277	-	312	240
November	-	389	276	-	318	236
December	-	389	272	-	326	244

1/Not available.
2/To June 15.

According to the average price of licensed Japanese exports of frozen tuna to the United States, the price of round albacore rose steadily since the fall of 1961. In November and December the price advanced to \$389 a short ton f.o.b., which was \$100 higher than at the beginning of 1961. At the start of 1962, prices began to decline and in February the albacore price dropped to \$360 a ton. Later, there was a gradual upward price trend and by May the price had climbed to an average of \$374 a ton.

In contrast, prices for gilled and gutted yellowfin tuna had been advancing since last year and in June 1962 were at an unprecedented high average \$350 a short ton. As compared with albacore, prices for yellowfin tuna through July this year remained firm.

Japan's export prices of frozen tuna to the United States are generally low in February and March each year due to light demand from the United States, and those months are usually referred to as a "weak period." In the case of yellowfin, however, such a trend was completely reversed this year and the price remained at a high level throughout the so-called "weak period."

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FROZEN TUNA APPROVED FOR EXPORT TO UNITED STATES:

The following quantities of frozen tuna, by species, were approved for export to the United States from Japan proper in Fiscal Year 1961 (April 1961-March 1962):

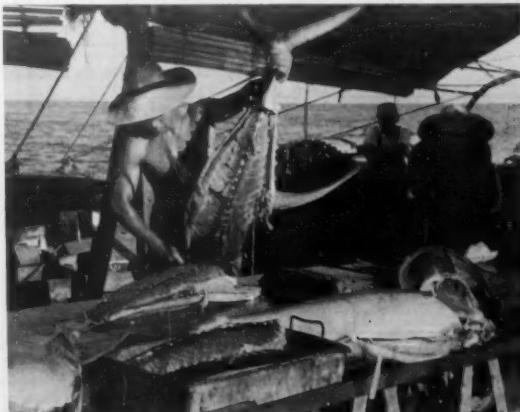
Product	Quantity Short Tons
Albacore, round	27,733
Albacore, other	1,267
Yellowfin, gilled and gutted	29,060
Yellowfin, other	8,366
Total	66,426

About 95 percent of the 66,426 tons was earmarked for some 12 principal United States buyers. (*Suisan Tsushin*, July 19, 1962.)

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TUNA AND SWORDFISH EXPORTS, CALENDAR YEARS 1956-60:

Japan's total exports of frozen and fresh (mostly frozen) tuna and broadbill swordfish (direct shipments and transshipments) during calendar year 1960 amounted to 124,741 actual tons (equal 125,538 metric tons), valued at \$34.2 million. Japanese tuna exports that



A worker filleting a yellowfin tuna aboard a Japanese tuna mother ship.

Japan (Contd.):

Japanese Frozen Tuna and Broadbill Swordfish Exports, 1956-1960

Species	Year	Quantity		Total Value Million US\$
		Actual ¹ / Tons	Metric ² / Tons	
<u>Direct Shipments:</u>				
Albacore	1960	25,185	24,187	7.7
	1959	24,760	24,761	8.5
	1958	22,127	20,760	7.0
	1957	34,966	36,188	10.6
	1956	22,012	21,043	8.2
Yellowfin	1960	31,054	31,609	8.4
	1959	34,999	35,743	9.0
	1958	46,620	45,709	12.4
	1957	30,906	33,420	7.7
	1956	32,501	31,078	7.3
Skipjack	1960	138	125	4/
	1959	1,204	1,092	0.2
	1958	2,711	2,475	0.5
	1957	21	23	4/
	1956	3/	3/	4/
Big-eyed	1960	90	88	4/
	1959	1,275	1,467	0.4
	1958	3,163	3,289	0.8
	1957	661	698	0.2
	1956	570	554	0.1
Other Tuna	1960	276	293	0.1
	1959	-	-	-
	1958	116	109	4/
	1957	254	244	0.1
	1956	322	293	0.1
Total Tuna	1960	56,743	56,302	16.2
	1959	62,238	63,063	18.1
	1958	74,737	72,342	20.7
	1957	66,808	70,573	18.6
	1956	55,406	52,969	15.7
Broadbill Swordfish	1960	5,168	6,713	3.3
	1959	4,797	6,234	2.5
	1958	5,075	6,585	3.3
	1957	4,132	6,263	2.8
	1956	6,041	8,417	3.7
Total Direct Shipments	1960	61,911	63,015	19.5
	1959	67,035	69,297	20.6
	1958	79,812	78,927	24.0
	1957	70,940	76,836	21.4
	1956	61,447	61,386	19.4
<u>Transshipments:</u>				
Albacore:	1960	8,017	7,273	2.2
	1959	1,509	1,369	0.5
	1958	383	347	0.1
Yellowfin:	1960	14,025	14,137	3.2
	1959	14,644	14,764	3.4
	1958	5,091	5,142	1.2
Tuna (to Europe)	1960	40,788	41,113	9.3
	1959	22,499	22,678	5.1
	1958	10,846	10,942	2.4
	1957	11,483	11,562	2.6
Total Transshipments	1960	62,830	62,523	14.7
	1959	38,655	38,811	9.0
	1958	16,320	16,431	3.7
	1957	11,483	11,562	2.6
Grand Totals	1960	124,741	125,538	34.2
	1959	105,690	108,108	29.6
	1958	96,132	95,358	27.7
	1957	82,423	88,398	24.0
	1956	61,447	61,386	19.4

1/Includes short tons and metric tons of actual shipment of products.

2/Converted to round fish in metric tons.

3/Less than 5 tons.

4/Less than US\$1,000.

year totaled 118,825 metric tons valued at \$30.9 million (direct shipments 56,302 tons valued at \$16.2 million, and transshipments 62,523 tons valued at \$14.7 million).

The 1960 Japanese tuna exports were up 16.6 percent from the previous year and the value increased 14 percent. Most of the increase was in Japan's transshipments, which were up 61 percent in 1960 as compared with 1959. The larger proportion of the transshipments were to Europe.

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EX-VESSEL TUNA PRICES IN TOKYO:

The following ex-vessel prices were paid on July 13, 1962, for 241 metric tons of frozen tuna and tuna-like fish landed in Tokyo by the Oasa Maru No. 8.

Product	Price	
	Yen/Kg.	\$/Short Ton
Yellowfin (round):		
Special lge. (over 120 lbs.) . . .	88.0	222
Large (100-120 lbs.)	115.7	292
Medium (80-100 lbs.)	127.4	321
Small (20-80 lbs.)	128.4	324
Fillets:		
Yellowfin	115.7	292
Big-eyed	100.2	253

The Oasa Maru No. 8 operated in the eastern Pacific Ocean in the vicinity of 100° W. longitude between 3° N. and 3° S. latitude. (Suisan Keizai Shimbun, July 15, 1962.)

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FROZEN TUNA EX-VESSEL PRICES AT TOKYO, AUGUST 10:

The following ex-vessel prices were paid on August 10, 1962, for about 500 metric tons of frozen tuna and spearfish landed at Tokyo



Frozen tuna at Tokyo Wholesale Fish Market.

Japan (Contd.):

by three Japanese tuna long-line vessels, reports the August 12, 1962, issue of the Japanese periodical Suisan Keizai Shimbun.

Frozen Tuna Ex-Vessel Prices at Tokyo, August 10

Product	Yen/kg.	\$/Short Ton
Yellowfin (gilled & gutted):		
Special lge. (over 120 lbs.)	90	227
Large (100-120 lbs.)	100-120	252-302
Medium (80-100 lbs.)	110-120	277-302
Small (20-80 lbs.)	115-120	290-302
Albacore (round)	138	348
Fillets:		
Yellowfin	115	290
Big-eyed	112-115	282-290

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SKIPJACK TUNA LANDINGS AT YAIZU:

Skipjack tuna fishing in inshore waters off Japan as of early July 1962 was good. Landings exceeding 300-400 metric tons were reported daily at Yaizu (Japan's most important tuna port). Early in July, this year's highest landings of 585 tons of skipjack were reported and the market had a liberal supply of that species.

The fishing area was from Zenisu Bank to Miyakejima Island, near enough to the coast for the fishermen to make a trip in two days with a catch of 20-30 tons a day. This type of fishing was expected to last until mid-July.

Landings of skipjack at Yaizu from April through the latter part of June totaled 12,173 tons worth US\$2.6 million ex-vessel. At the same time last year, 1,935 tons (valued ex-vessel at \$175,799) more skipjack were landed. Landings at the beginning of June were up, with schools near the shore. By the latter half of June, 6,234 tons, valued at \$1.2 million, were landed (3,637 tons worth \$718,475 were landed at the same time last year). The fishing was so good that some 30 skipjack vessels came into port every day with full loads. (Japanese periodical, July 7, 1962.)

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YAIZU FISHERY LANDINGS,
JANUARY-JUNE 1962:

A total of 72,988 metric tons of fish valued at US\$20.2 million was landed at Yaizu (leading Japanese tuna fishing port) in the first half of this year. This was 159 tons and \$1.3 million more than in the same period of 1961.

Landings in June were 4,970 tons (value \$1,570,839) of tuna other than skipjack and 9,498 tons (\$1,807,819) of skipjack. The port's total June landings were 17,057 tons, valued at \$4.2 million. June 1962 landings surpassed the record for the same month last year by 2 percent in quantity and 3 percent in value. Skipjack landings in June 1961 were only 4,894 tons, valued at \$1.1 million. While skipjack landings this June were so much more than last year, albacore tuna landings were not even one-third of last year's landings.

Table 1 - Yaizu Fishery Landings, Principal Species, January-June 1962 with Comparisons

Species	Quantity		Value	
	1962	1961	1962	1961
(Metric Tons)			(US\$1,000) . .	
Albacore tuna	10,266	14,000	4,018	4,387
Skipjack tuna	16,118	12,653	3,367	2,907
Other tuna	34,165	34,753	11,352	10,061
Mackerel	8,488	7,806	791	945
Others	3,950	3,608	671	607
Total	72,988	72,829	20,199	18,917

Table 2 - Summer Albacore Tuna Landings at Japanese Port of Yaizu, March-June 1962 with Comparisons

Month	1962	1961
	(Metric Tons) . .	
June	1,576	5,253
May	2,758	3,512
April	1,269	1,215
March	1,801	1,266

Usually summer albacore landings keep the Yaizu fish market busy from the beginning through the middle part of summer. Landings usually taper off in mid-July or the beginning of August at the latest. This year the season ended about mid-July, with landings light throughout the season. Each year the peak of the season is in June and landings continue well into the beginning of July. Things were different this season. In the beginning of July, landings amounted to only a few tons a day up to the 5th of the month. In June, total albacore landings were 1,376 tons, while last year when fishing was considered only fair, 5,213 tons were landed. There has been no record of landings of less than 2,000 tons in any June in past years. Records of the past 7 years show the following landings of albacore tuna at Yaizu: 5,200 tons in 1961, 5,800 tons in 1960, 2,200 tons in 1959, 5,500 tons in 1958, 9,300 tons in 1957, 7,200 tons in 1956, and 2,400 tons in 1955. While 200 or 300 tons of albacore are landed daily during the peak of the season in June, this year good skipjack fishing was found in inshore waters and around the Bonin Islands at the end of May and fishing vessels normally fishing albacore concentrated on skipjack. This resulted in unprecedented light landings of summer albacore.

Catch of albacore was normal March through April, but in May light landings became conspicuous. In June, summer albacore fishing almost ended affected by good skipjack fishing.

Oceanic conditions too were not exactly suitable for albacore fishing, with the boundary of the Black and Kurile Currents less definitive than usual. (Suisan Keizai Shimbun, July 14 and 16, 1962.)

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TUNA FISHING CONDITIONS OFF HOME ISLAND, EARLY JULY 1962:

As of July 10, 1962, fishing for skipjack tun in Japanese waters was reported good off northeastern Japan about 120-140 nautical miles to the east and southeast of Kinkazan, Miyagi Prefecture. Several vessels were reported to have caught from 30-40 metric tons a day. Off central Japan, skipjack fish-

Japan (Contd.):

ing slowed down, although fishing was reported still fair off Cape Omaezaki, Shizuoka Prefecture.

Landings of skipjack at Yaizu July 1-10 totaled 3,260 metric tons. Ex-vessel prices firmed up somewhat during the month, with a high of 145 yen per kilogram (US\$365 a short ton) and low of 46 yen per kilogram (\$116 a short ton) being paid for 383 metric tons landed on July 10. On July 9 a high of 135 yen per kilogram (\$340 a short ton) and low of 42 yen per kilogram (\$106 a short ton) were paid for 685 metric tons of skipjack landed on that day. Compared to those prices, in late June skipjack sold for a high of 120-125 yen per kilogram (\$302-315 a short ton).

According to data published by the Fisheries Agency, a near record 9,498 metric tons of skipjack were landed at Yaizu for the month of June. However, for the same month skipjack landings at the five principal ports in Miyagi Prefecture in northeastern Japan (Kesennuma, Shiogama, Ishinomaki, Onagawa, and Watanoha) totaled 15,590 metric tons, or 4,268 metric tons less than in June 1961, according to press reports. With the shift in skipjack fishing to the waters off Miyagi Prefecture, early July landings of skipjack at the five ports were reported to have picked up considerably.

Albacore fishing was still very poor and incidental catches of about 100 albacore a day were reported by the pole-and-line skipjack fleet. The few albacore that were landed at Yaizu brought ex-vessel prices ranging from 150 to 165 yen per kilogram (\$378-416 a short ton).

Landings of skipjack and albacore tuna for the five-year period of 1958 to 1962 April-June are shown in tables 1 and 2. (Suisan Keizai Shimbun, July 13, 1962, and other sources.)

Table 1 - Skipjack Tuna Landings at Yaizu, April-June 1958-62

Year	April	May	June	Total
..... (Metric Tons)				
1962	987	4,971	9,498	15,466
1961	1,953	4,647	5,894	12,494
1960	2,000	3,258	3,241	8,499
1959	3,352	8,465	10,400	22,217
1958	2,437	6,362	4,143	12,942

Table 2 - Albacore Tuna Landings at Yaizu, April-June 1958-62

Year	April	May	June	Total
..... (Metric Tons)				
1962	1,271	2,738	1,577	5,586
1961	1,215	3,512	5,253	9,980
1960	911	4,516	5,802	11,229
1959	428	791	2,184	3,403
1958	1,228	2,361	5,478	9,067

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TUNA QUOTAS INCREASED FOR MOTHERSHIPS AND CERTAIN OVERSEAS BASES:

Increases in tuna production quotas for the overseas-based fisheries and the mothership-type tuna fishery for FY 1962 (April 1962-March 1963) were announced by the Japanese Fisheries Agency on August 3, 1962.

The 6,000-ton quota increase for American Samoa was allocated only to the one Japanese fishing company, which submitted an application earlier this year to engage in

tuna fishing from that Island. Two other Japanese fishing firms, which are currently delivering tuna to the cannery (operated by a United States west coast tuna canning firm) at Samoa, were not granted any quota increase. The quotas for those two firms are: 8,000 tons and 4,000 tons. This gives American Samoa a total quota of 18,000 short tons.

Japanese Tuna Quotas for Motherships and Certain Overseas Bases

	FY 1962	FY 1961	Increase
..... (Short Tons)			
Espirito Santo, New Hebrides	6,000	4,000	2,000
American Samoa	18,000	12,000	6,000
Penang, Malaya	6,000	6,000	-
..... (Metric Tons)			
Mothership-type tuna fishery	27,000	22,900	4,100

Production quotas were not allocated to the tuna base planned for Levuka, Fiji Islands, under the so-called Matsuda Plan, or to the proposed tuna bases at Tahiti and New Caledonia. However, the Agency announced that it has established a special provision in the law whereby overseas bases can be licensed if they meet the conditions newly-established by the Agency. Based on this special provision, the Agency is reviewing the application submitted by Japanese firms seeking approval to establish fishing bases at Tahiti, Fiji Islands, and New Caledonia, and it is reported that the Agency is likely to authorize a production quota of around 2,000-3,000 tons for the Fiji Islands tuna base. (Suisan Tsushin, August 1, 4, and 8, 1962.)

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FISHERIES AGENCY REQUESTS VESSELS TO SUBMIT YELLOWFIN TUNA CATCH DATA:

The Japanese Government, which recently pledged its cooperation in submitting Japanese tuna catch data for the eastern Pacific Ocean, has instructed the National Federation of Japan Tuna Fisheries Cooperative Associations and the Japan Tuna Fishermen's Association to submit to the Fisheries Agency catch data on all yellowfin tuna taken from the eastern Pacific Ocean within the Inter-American Tropical Tuna Commission proposed area of regulation. Data to be reported to the Fisheries Agency are:

1. Quantity (in number) and weight of yellowfin tuna, and amount of other species of fish taken from within the regulatory area after January 1962 and landed before July 31, 1962, on a trip basis. Vessels fishing within the proposed regulatory area, but which have

Japan (Contd.):

not returned to their home ports as of July 31, will report this same information.

2. Quantity (in number) and weight of yellowfin and amount of other species of fish landed during each month after August 1, 1962. However, in cases where a vessel trip extends to the following year or if fishing was done partly outside the proposed regulatory area, a monthly report showing the quantity and species of tuna taken from within the proposed regulatory area shall be filed. In addition, a report showing the catch for the entire trip must be filed.

3. Catch data for the period up to July 31, 1962, will be submitted to the Fisheries Agency by August 15, and the monthly data for the period after August 1 must be filed with the Agency by the tenth of the following month. (Suisan Keizai Shimbun, August 3, 1962.)

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RESEARCH VESSEL TO SURVEY EASTERN PACIFIC OCEAN TUNA RESOURCES:

The Japanese Fisheries Agency's research vessel Shoyo Maru (602 gross tons) is scheduled to conduct a survey of tuna resources in the eastern Pacific Ocean from mid-October of this year. The Shoyo Maru is expected to survey the waters to the west of the area fished by the United States purse-seine fleet but within the United States-proposed regulatory area for yellowfin tuna, as well as the waters south of the proposed regulatory area, that is south of 30° S. latitude. (Suisan Keizai Shimbun, July 4, 1962, and other sources.)

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RESEARCH VESSEL INVESTIGATES ALBACORE SCHOOLS IN NORTH PACIFIC:

The Tokai Daigaku Maru, a 190-ton training and research vessel of Tokai University, returned to a Japanese port about the end of June, from a 25-day voyage to investigate small and medium albacore tuna in waters east of 140° east longitude.

The University's research scientists aboard the vessel conducted investigations to substantiate the theory of finding more schools of small and medium-fish in more northerly sections of the Pacific. Although such schools were found, the strength of the Kurile Current thrusting into the Black Current running eastward was not strong enough this year.

Because of this, the area where the two currents mingled was not definitive enough for the fish schools to linger. This failed to bring about the expected results.

The vessel took a course moving northward along the Izu Seven Islands to 30° north latitude, then eastward to 150° east longitude. The investigations were repeated around 33°-34° north latitude, 147°-148° east longitude. Albacore schools were discovered around 34° north latitude, 142° east longitude, but were lost sight of after hooking a few fish. (Suisan Keizai Shimbun, June 30, 1962.)

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VESSELS OPERATING IN SOUTH ATLANTIC TUNA FISHERY, JULY 1962:

As of early July 1962 there were 68 Japanese vessels operating in the South Atlantic tuna fishery as compared with 69 in May, 77 in April, and 80 in March. The number fishing in that area since March 1962 has been declining steadily. The daily catch per boat on the average was 4-5 metric tons of fish--considered only fair fishing.

The peak of the yellowfin tuna season in the Atlantic lasted for the seven months period March-September, from 1957 through 1960. Last year, however, yellowfin fishing took a turn for the worse in July and the so-called big-eyed fishing season began. Based on the results of the vessels through early July, the peak of the yellowfin season was expected to end earlier this year than last year, and the big-eyed fishing season might have actually begun in June. The catch ratio this year was some 40 percent big-eyed to 60 percent yellowfin. Depending upon the location of vessels, this was not much different from last year's July-August season. However, since this year the export price of big-eyed tuna has advanced, this year's operation seems more profitable than last year's.

The Japanese industry and Government are considering ways and means to cope with the extremely poor tuna fishing in the South Atlantic. Six years have elapsed since a new tuna fishing ground was developed in the South Atlantic in 1958. Since then there has been a decline in catch ratio and catch per day. This drop in yield has not been encountered only in the Atlantic, but also in the Indian Ocean and Pacific. But the decline has been more pronounced in the Atlantic.

The recent catch rate in the South Atlantic is said to be 8,300-12,400 pounds per day by the 240-ton-class tuna vessels as compared with 24,800-33,100 pounds per day in 1960 when fishing was good. From the standpoint of management, the catch yield causes the operation to only just about break even.

The poor fishing for Atlantic tuna is curtailing exports to Italy. Because the Italian Government has limited frozen tuna imports to 25,000 metric tons, some tuna interests in Japan see no necessity of concentrating on exports to Italy as there are a number of other countries wanting to import Japanese tuna. (Suisan Keizai Shimbun and Suisan Tsushin, July 6, 1962.)

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RESEARCH VESSEL TO EXPLORE FOR TUNA IN SOUTH ATLANTIC OCEAN:

In order to find new fishing areas for the Japanese tuna fleets, the Japanese Fisheries Agency is planning to dispatch the research

Japan (Contd.):

vessel Shoyo Maru (603 gross tons) to the South Atlantic Ocean next year. The tuna fleets, yearly, are extending their range of operations to distant waters.

The Shoyo Maru is scheduled to depart Japan on September 23, 1963, and is expected to arrive at the fishing grounds off the coast of West Africa on November 4, where it will conduct initial exploratory fishing until November 29. The vessel will then call at Luanda, Angola, from where it will proceed to Rio de Janeiro, Brazil, and resume exploratory operations in the southwest Atlantic Ocean. The Shoyo Maru is scheduled to return to Japan by way of the Panama Canal on March 31, 1964. (Suisan Keizai Shimbun, August 8, 1962.)

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NEW ALBACORE TUNA AREAS IN ATLANTIC DISCOVERED:

As of mid-July 1962, a total of 81 Japanese tuna long-line vessels were reported to be fishing in the Atlantic Ocean, or 13 more vessels than in June. A number of these vessels are said to have conducted exploratory fishing in the waters nearby Puerto Rico, described as new fishing areas, and found good fishing for albacore. Reportedly, they are catching about 4 metric tons of albacore per day.

The Japanese Atlantic tuna vessels appear to be placing great hopes on the new albacore areas. In the past, albacore fishing has proven to be slow throughout the Atlantic at that time of the year. The albacore areas normally fished by the Japanese are located off Brazil, but this fishery does not begin until the fall season. (Suisan Tsushin, July 27, 1962, and other sources.)

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ADDITIONAL TUNA VESSEL TONNAGE:

The allocation of a 20,000-ton increase in tuna vessel tonnage to be used in the next two years for the construction of tuna vessels as replacements for fishing vessels to be withdrawn from the depressed fisheries was announced by the Japanese Fisheries Agency on August 3. Vessels to be constructed will total approximately 200 vessels, primarily under 100 tons gross. Present size of the tuna fleet, in terms of total gross tonnage, is nearly 248,000 gross tons.

Additional Vessel Tonnages Allotted to Different Japanese Fisheries	
Fishery	Allocated Tonnage
Salmon	Gross Tons 10,500
Coastal	3,000
Trawl	3,000
Surrounding net	1,500
Tuna	1/2,000
Total	20,000

1/To be allocated to tuna vessel owners who are planning to construct vessels larger than 99 gross tons.

The additional tonnages allotted to the different Japanese fisheries for the construction of new tuna vessels are as shown in the table. (Suisan Keizai Shimbun, August 4, 1962.)

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CHANGES SOUGHT IN REGULATIONS ON PORTABLE-VESSEL-CARRYING TUNA MOTHERSHIP-TYPE OPERATIONS:

The Japanese Fisheries Agency in August 1962 was studying applications submitted by four large fishing companies which hope to operate portable-vessel-carrying tuna motherships solely as carriers and to employ for fishing purposes only the catcher vessels carried by the motherships. This type of operation differs with the existing portable-vessel-carrying mothership-type operation in that the mothership will not engage in fishing.

Purpose of this plan is to circumvent restrictions on construction of large tuna vessels. At the present time, existing tuna vessels of certain prescribed tonnages must be retired from the tuna fishery before larger tuna vessels of specific sizes can be constructed in their places. Under the plan proposed by the large fishing companies, the large tuna vessels carrying portable catcher boats would not directly engage in fishing but serve as carriers, which do not require tuna licenses. Thus, being "carriers" and not "fishing vessels," they would be exempt from existing restrictions governing construction of large tuna vessels.

Reportedly, two of the firms are planning to operate 3,700-ton tuna motherships, each carrying eight portable fishing vessels. The other two are reported to be planning on operating tuna motherships carrying 8-10 portable vessels, which they hope to dispatch to the Indian Ocean.

At present, a total of 23 large fishing vessels are licensed as portable-vessel-carrying tuna motherships, the largest of which is

Japan (Contd.):

the Kuroshio Maru No. 21 (1,900 gross tons), which carries six portable vessels. (Shin Suisan Shimbun, August 13, 1962.)

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TUNA FISHING VESSEL TESTS POWER BLOCK:

The first power block ever to be used in Japan was reported to have been installed this summer on a large surrounding net (probably purse seine) vessel belonging to a large fishing company. This hydraulic power block was imported from the United States and was installed on the tuna vessel Kenyo Maru (240 gross tons) at a cost of about 3 million yen (US\$8,333).

Immediately after installation of the power block, the Kenyo Maru departed for the skipjack fishing grounds off the coast of northern Japan to test its efficiency.

The Japanese Fisheries Agency and the Japanese fishing industry reportedly are conducting studies on the possibilities of adopting power blocks and on improving vessel designs and fishing nets in an effort to increase further the operational efficiency of surrounding-net gear. The Government has already appropriated a sum of 2,080,000 yen (US\$5,800) for FY 1962 (April 1962-March 1963) aimed at studies to improve the efficiency of surrounding nets used by fishing vessels operating out of Nagasaki.

The Agency has for some time urged the Japanese surrounding-net industry to study the actual operations of efficient United States purse seiners employing power blocks. At a recent meeting of the North Pacific Ocean Surrounding Net Fishery Council held in Aomori Prefecture in northern Japan, the Council members urged that a group of Japanese vessel owners be sent to the United States to observe the operations of United States purse seiners, and a tour has been tentatively organized, with plans to send one fishery cooperative member each from Aomori, Iwate, Miyagi, Fukushima, Ibaraki, and Chiba Prefectures. Arrangements for overseas travel and other administrative affairs related to this tour are to be handled by the Japan National Federation of Fishery Cooperatives. (Suisan Keizai Shimbun, July 25, and August 8, 1962.)

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TUNA COMPANY TO BE ESTABLISHED BY COOPERATIVE:

The Japan National Federation of Fishery Cooperatives (ZENGYOREN) early in August reportedly was planning on forming a tuna fishing company to conduct tuna fishing in the South Pacific Ocean. The president of the firm and the directors are said to have approached the Fisheries Agency Director to seek Government approval and support for their plan. But the Agency has made it clear that it does not intend to approve such a plan.

Under the original plan, the company would be assigned 30 tuna vessels (99 tons each), the construction of which the Fisheries Agency is expected shortly to authorize under the Government's plan to promote the coastal fishery cooperatives in 15 prefectures (at the rate of two vessels per prefecture), in line with the Government's over-all plan to increase the total authorized tuna vessel tonnage in Japan by 20,000 tons in the next two years. The Federation contends that if each prefectoral fishery cooperative forms its own separate organization to operate the newly-licensed 99-ton tuna fishing vessels, they will all certainly run into operational and financial difficulties. Therefore, to insure effective utilization of these 30 tuna vessels, the Federation would organize, above the prefectoral cooperatives, a central company to operate the 30 vessels. The central company would enter into a contract with a large fishing company to engage in joint tuna fishing, whereby the Federation would provide the catcher vessels and the large fishing company the mother-ship. Several large Japanese fishing firms were reported to be interested in entering into an agreement on this basis with the Federation, which reportedly had asked for a production quota of 5,000 metric tons of tuna for export purposes. (Minato Shimbun, July 17; Nihon Suisan Shimbun, July 23, 1962.)

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NATIONAL COOPERATIVE SCHEDULES MEETING TO STUDY USE OF ITS TUNA VESSELS:

The Japan National Federation of Fishery Cooperatives (ZENGYOREN) was scheduled to meet in Tokyo on August 17 to discuss the use of the 30 tuna vessels (99-tons each) newly-licensed to its 15 regional fishery cooperatives (2 vessels per cooperative). ZENGYOREN had originally hoped to utilize the 30 vessels in the tuna mothership fishery, with the mothership to be provided by a large fishing company. However, the Fisheries

Japan (Contd.):

Agency does not intend to license such a venture, so the August 17 meeting was scheduled to study other ways and means of most effectively using the 30 tuna vessels.

The key question to be resolved at the meeting is whether each regional cooperative should independently operate its two tuna vessels or whether ZENGYOREN should form a central organization to operate the 30 vessels belonging to the regional cooperatives. (Suisan Tsushin, August 15, 1962.)

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LONG-LINE VESSELS REACH SALMON CATCH GOAL SOUTH OF 45° N. LATITUDE:

The Japanese land-based long-line fleet of about 369 vessels fishing for salmon off Eastern Hokkaido south of 45° N. latitude (Area B) stopped fishing on June 25, 1962, five days earlier than usual. The fleet had attained its catch goal of 10,000 metric tons. The fleet reported unexpectedly good fishing. In 1961, the salmon catch by the long-line fleet in Area B amounted to about 14,000 tons.

The over-all salmon catch quota for both long-line and gill-net vessels in Area B this year was 60,000 tons, a reduction of about 20,000 tons from the previous year's quota. In 1962, Area B was added to the area regulated by the Japan-Soviet Northwest Pacific Fisheries Convention (Japanese newspaper, July 4, 1962).

Ex-vessel prices for the long-line salmon catch in Area B in 1962 were as follows:

Species	Value	
	US\$/Metric Ton	U. S. Cents/Pound
Salmon, fresh . . .	729	33.1
Trout, fresh . . .	603	27.3
Salmon, salted . . .	754	34.2
Trout, salted . . .	528	23.9

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SALMON MOTHERSHIP FLEETS IN NORTH PACIFIC REACH CATCHQUOTA:

Japanese press reports indicate that the 11 Japanese salmon mothership fleets in North Pacific had reached their catch targets and were expected to return to Japan by August 2, 1962. Two of the first motherships to return to Japan were the Chiyo Maru (7,653 gross tons) and Miyajima Maru

(9,598 gross tons)--they arrived in Hakodate on July 25.

According to press reports, red salmon was estimated to make up 60 percent of the total catch of the 11 fleets. This season's catch by species was estimated to be: red salmon 26,000 metric tons, chum 15,000 tons, pink 2,000 metric tons, and silver 1,500 tons. The catch quota for the salmon mothership fleets this year was 44,665 metric tons.

Reportedly, several factors stood out in this year's operation: the abundance of red salmon of Asian origin; lack of red salmon of Bristol Bay origin; lack of pink salmon; and abundance of silver salmon towards the latter part of the fishing season. The 11 fleets were reported not to have operated in the eastern area (towards the abstention line) but concentrated their operations to the west this year. (Suisan Keizai Shimbun, July 20, Hokkai Suisan, July 30, 1962, and other periodicals.)

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FROZEN HALIBUT EXPORT PRICES STEADY:

Japanese exports of frozen halibut to the United States were comparatively good in June, according to translations of articles from Japanese periodicals. Export prices during that month were officially quoted at 45-47 U. S. cents a pound, c.i.f. the United States east coast.

Ex-vessel halibut prices in Japan were reported to be 160-170 yen per kilogram (20.1-21.4 cents a pound). (Suisan Tsushin, July 21; Shin Suisan Shimbun Sokuho, July 20, 1962.)

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BERING SEA HALIBUT LANDINGS:

The Japanese bottom fishing fleets in the Bering Sea were reported to have already caught a total of 8,000 metric tons of halibut as of June this year, according to a translation from the Japanese periodical Suisan Tsushin of July 21, 1962. It was reported that by the end of the 1962 fishing season, landings of 12,000 tons of halibut may be reached.

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KING CRAB OPERATIONS IN BRISTOL BAY:

The Tokei Maru crab fishing fleet, jointly operated by two Japanese fishing firms, was

Japan (Contd.):

reported to have left its fishing ground in Bristol Bay early in July 1962. The fleet completed its production target of 60,000 cases of canned crab meat and was returning to Japan.

The Dainichi Maru crab fishing fleet, under the joint management of two other Japanese fishing firms was expected to attain its production goal of 70,000 cases in the middle of July. (Suisan Keizai Shimbun, July 3, 1962.)

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GOVERNMENT ISSUES FALL KING CRAB FISHING LICENSES AND REGULATIONS:

Eight Japanese fishing firms planning to operate jointly two king crab mothership fleets in the eastern Bering Sea this fall were issued licenses on July 30, 1962, by the Fisheries Agency. Four firms will operate jointly the mothership Ishiyama Maru (5,630 gross tons) and the other four will operate jointly the mothership Shinyo Maru (5,632 gross tons).

The Ishiyama Maru fleet, which consists of 8 catcher vessels, was scheduled to depart Hakodate on August 5. The fleet's catch quota is 400 metric tons of king crab. The Shinyo Maru fleet, which was scheduled to depart on August 10, will consist of 4 catcher vessels and 4 "Kawasaki" (portable launch-type) vessels, each of 20 tons gross. The Shinyo Maru's production quota is 350 metric tons of king crab. Both fleets are reported to be planning on producing frozen "discs," described as crab meat which has been processed and prepared for immediate canning at shore installations.

The Fisheries Agency has issued the following regulations concerning the fall king crab operations:

1. Fishing season will be from August 1 to November 30.
2. The following areas will be closed to fishing: Area formed by a line drawn from Unimak Island north along 164° W. longitude to the points 56° N.-164° W., 56°20' N.-163° W., 57°10' N.-163° W., and 58°10' N.-160° W., and south along 160° W. longitude to the Alaska Peninsula.
3. Possession and/or use of gear other than crab tangle nets are prohibited.
4. Capture of female crabs and of crabs measuring less than 13 centimeters (5.1 inches) in carapace width is prohibited. However, such crabs may be taken incidentally in the catch if they do not average more than one crab per "tan" (shackle) of net set by a vessel.
5. Fishing vessels must not refuse to allow foreign officials, who have been properly authorized under international fisheries agreement, to inspect and search their vessels. Vessels that have been subjected to inspection and search must promptly report to the Fisheries Agency.
6. Operational instructions deemed necessary and, therefore, issued by the Fisheries Agency inspector must be complied with.
7. The outfitting of motherships and catcher vessels may be restricted, when necessary, to regulate fishing operations.
8. Vessels engaged in the transportation of catches and processed products must be equipped with radio and direction finders.

9. Products to be unloaded at port of landing will be counted by an inspector and a certificate showing quantity will be issued, which must be submitted to the Fisheries Agency. (Suisan Keizai Shimbun, July 31; Suisan Tsushin, July 5, 1962, and other periodicals.)

LANDINGS OF FISHERY PRODUCTS IN 1961:

According to a preliminary report, Japan's total landings (excluding whaling operations) in the 1961 calendar year amounted to 6,710,000 metric tons--a new record and 8.4 percent more than the previous year's landings of 6,190,000 metric tons.

Japan's Landings by Type of Fishery, 1960-61 ^{1/}		
Type of Fishery	1961	1960
Marine landings	• (1,000 Metric Tons) . . .	•
Marine landings	6,230	6,280
Shallow-water	320	280
Fresh-water	90	80
Other aquatic products	20	20
Total landings	6,710	6,190

^{1/}Does not include whaling.

Marine landings accounted for 93.6 percent of the total catch in 1961. The flatfish catch by the mothership fleets in the North Pacific showed a substantial gain in 1961.

Catches in 1961 by mothership-type trawling, gill-netting, long-lining in "northern waters" (North Pacific and Bering Sea) were up 180,000 tons from 1960. A recovery in the mackerel pike dip-net fishery (landings up 190,000 tons), and better catches in the skipjack hook-and-line fishery (landings up 60,000 tons) contributed to the gain in total landings.

A number of vessels were added to the tuna fleet in 1961 and new tuna fishing grounds were also developed. In spite of the increase in fishing effort, the tuna long-line catch showed only a modest increase. Landings by tuna long-liners operating out of Japanese ports were up 30,000 tons and the catch of long-liners in the Atlantic was up 10,000 tons.

In 1961, some 20,000 large whales (an increase of some 1,000) and 950 small whales (an increase of some 160) were caught by Japanese whaling operations. (Japanese news-paper, June 20, 1962.)

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SALMON INDUSTRY URGES END OF ABSTENTION PRINCIPLE:

The Special Committee on Tripartite (Canada, Japan, United States) Fisheries Problems, organized by the Japan Fisheries Society, held its first meeting on August 9, 1962,

Japan (Contd.):

and formally decided to file a petition to the Japanese Government strongly urging that the abstention principle of the present Japan-Canada-United States North Pacific Fisheries Convention be abolished. In attendance at the meeting were leading members of the Japanese salmon industry, including fishermen's unions and associations.

The Committee planned to adopt concrete policies after first determining the intentions of the United States and Canada at the interim meeting which convened in Hawaii on August 13. At the meeting, the Committee Chairman announced that the present Treaty is unfair and it would be better to negotiate a new treaty. (As reported and translated from the Japanese periodical Suisan Keizai Shimbun, August 10, 1962.)

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SOCIALIST PARTY OPPOSES EXTENSION OF TRIPARTITE NORTH PACIFIC FISHERIES CONVENTION:

Japan's Socialist Party has decided to oppose the extension of the present Tripartite (Canada, Japan, United States) North Pacific Fisheries Convention. It plans to question the Government's policy on this issue at a special Diet session. The Socialist Party is also expected to urge the Japanese Government to terminate its membership in the Tripartite Commission as soon as Japan fulfills her present Treaty obligations, and to establish a basic policy to guide Japan's fishing activities on the high seas so that Japan can negotiate a reasonable fisheries treaty based not on the voluntary abstention principle but on the principle of equality reciprocity, resource conservation, and prevention of disputes. The Socialist Party claims that the existing Fisheries Treaty is: (1) unequal; (2) not based on scientific findings; and (3) adversely affects the development of the Japanese fishery. (As reported and translated from the Japanese periodicals Suisan Keizai Shimbun and Minato Shimbun, August 11, 1962.)

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FISHING FIRMS PLAN TRAWL FISHING IN NORTHWEST ATLANTIC:

Three Japanese fishing firms are reported to be planning trawl fishing for cod in the northwest Atlantic Ocean off the southwest coast of Greenland. The three companies were expected to file applications with the

Fisheries Agency by early August this year to engage in that fishery, and the Agency is said to have unofficially approved one application.

According to present plans, one firm plans to employ its freezer ship Tenyo Maru No. 3 (3,500 gross tons) which it will convert into a stern trawler, and assign to it two portable catcher vessels, each of 20 gross tons. The second company plans to operate one vessel Aoi Maru No. 2 (1,100 gross tons). The third company will operate a 1,500-ton trawler. Upon approval by the Fisheries Agency, the three companies plan to make necessary preparations so that fishing operations can be launched in the spring of 1963. The company whose application reportedly has been officially approved hopes to start operations this year. The three firms hope to export their cod catches to the United States and to Europe.

According to press reports, the Japanese Fisheries Agency is considering the possibility of joining the International Northwest Atlantic Fisheries Commission. (Suisan Tsushin and Suisan Keizai Shimbun, July 24; Nihon Suisan Shimbun, July 25, 1962.)

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FISHERIES AGENCY AUTHORIZES TRAWLING IN NORTHWEST ATLANTIC OCEAN:

A Japanese press report of August 1, 1962, states that the Fisheries Agency has officially authorized a Japanese fishing company to operate a trawler in the northwest Atlantic Ocean. The company was scheduled to dispatch the Aoi Maru No. 2 to the waters off Greenland on August 2. The trawler was to depart from the Japanese port of Nagasaki in southern Japan and was expected to arrive off Greenland in early October. (Suisan Tsushin, August 1, 1962.)

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GUIDANCE AND CONCENTRATION OF FISH SCHOOLS TO BE STUDIED:

The Japanese Fisheries Agency reportedly is planning on a new three-year fishery research program from FY 1963 (April 1963-March 1964) to conduct basic studies on methods of guiding and concentrating fish schools. The primary objective of this research program will be to develop an effective method of concentrating fish schools of relatively low density, such as those fished by means of gill nets, as well as to develop suitable fishing methods and gear. As a means of attracting or guiding fish, lights, guiding nets, air curtains, and articles both attractive and repulsive to fish will be used in the study. This program will be supervised by the Tokai Regional Fisheries Research Laboratory at Tokyo and is scheduled to be conducted in three phases.

Japan (Contd.):

FY 1963: Basic experiments with low-density fish schools will be conducted. Experiments will be conducted with fish held in tanks and in ponds and lakes. As means of concentrating fish, lights will be used to test the reaction of rainbow trout and kokane (land-locked red salmon). Tests will be conducted to guide fish by such means as artificially-created air curtains and cold-water zones, in addition to nets.

FY 1964 (April 1964-March 1965): Methods of concentrating fish developed in the preceding year will be put to practical tests in lakes and in coastal waters to determine their feasibility. In these tests, small set nets, surrounding nets, and midwater trawls will be used. Studies will also be made regarding possibilities of separating catches.

FY 1965 (April 1965-March 1966): Field tests in coastal waters will be continued to determine the effectiveness of the methods developed. If results are satisfactory, the new methods will be introduced subsequently to commercial fishermen.

Reportedly, the above studies are being prompted by the problem faced by the Japanese salmon fishery, where, despite improvements in fishing efficiency brought about through refinements in fishing techniques and gear, the problem of gilled salmon falling off from the nets and of salmon being injured by gill nets have not yet been solved. Gear-caused injury and mortality have been the subject of discussion at every annual fisheries negotiation held between Japan and the Soviet Union, and Japan plans to conduct the above studies in an attempt to solve this problem. (Susan Keizai Shimbun, July 11, 1962.)

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NEW MARINE RESEARCH**INSTITUTE ESTABLISHED:**

A new Institute, called the Ocean Research Institute, University of Tokyo (ORITU), was established in Tokyo in April 1962.

The Institute is the first of its kind established in Japan for the scientific study of basic problems of the oceans, their resources, and fisheries. It is expected that the Institute will have 15 divisions, with a full staff of about 200 professionally-trained persons within a few years. They will cover the fields of physical oceanography, submarine geophysics, marine meteorology, submarine geology, chemistry and biochemistry of the oceans, marine biology, and various phases of scientific fisheries. The Institute plans to have two research vessels, one of 250 tons and another of 3,000 tons, to be used primarily for exploring the deep sea and ocean floor.

The Institute was established at the University of Tokyo for two main reasons: 1. It was the general consensus of Japanese marine scientists that there should be a Japanese institution exclusively devoted to the study of basic marine problems. 2. They believed it would be more appropriate if the Institute were set up as an adjunct of the University of Tokyo. The Institute will be used not only by the scientists from the University of Tokyo, but also by those from other

universities and organizations of Japan. It is also expected that scientists from other countries will be able to do research at the Institute.

The office of the new Institute was temporarily located on the campus of the University of Tokyo. Plans are being made for a building in a permanent location not far from the main campus of the University.

**Republic of Korea****FIRM TO PURCHASE TUNA VESSELS:**

The U. S. Foreign Investment Promotion Committee, on June 28, 1962, approved an application for foreign investment by a South Korean firm for the procurement of six 135-ton tuna vessels. It was reported that an investment of \$720,000 is to be financed by a loan from the New York subsidiary of a Japanese firm. The six tuna vessels are to join the vessels being operated by the Korean firm in Samoan waters.

Tuna caught by the Korean firm's fishing fleet is supplied, under contract, to a United States packer's cannery plant in American Samoa. (United States Consulate, Seoul, July 13, 1962.)

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**SIX TUNA VESSELS TO BE
BUILT IN JAPAN:**

A Korean firm, which presently operates a number of tuna vessels out of American Samoa, is reported to be planning on constructing six tuna vessels in Japan with the aid of United States capital. Reportedly, the order for the vessels has already been placed with a Japanese shipbuilder.

Exports of Japanese tuna vessels are prohibited by the Japanese Government. To circumvent this restriction, the six vessels are to be constructed not as tuna fishing vessels but as carriers and, supposedly, are for export to Switzerland, from which the Korean firm would purchase the vessels.

Without a doubt, all the vessels will be based at American Samoa. This means that they will enter into direct competition with Japanese tuna vessels, but, despite this, the Japanese Government licensed the construction of these vessels. Consequently, strong objections are being voiced within the Japa-

Republic of Korea (Contd.):

nese tuna industry. (Suisan Tsushin, July 26, 1962.)

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FISHERY COOPERATIVES LAW ENACTED:

A new fisheries cooperative law was enacted by South Korea early in 1962, to encourage the economic development of the fishing industry.

Almost 32 percent of the marketing cooperatives had business volumes of \$1 million or more. About 13 percent of the farm supply cooperatives had business volumes of \$1 million or more. No cooperative whose business was primarily performing services related to marketing or farm supply purchasing reported a business volume of \$1 million or more.

Almost 22 percent of these cooperatives did a business ranging between \$1 and \$10 million in 1959-60 compared with about 17 percent in this group in 1955-56. About 2.4 percent reported a business volume upwards of \$10 million in 1959-60 compared with 1.7 percent doing a comparable volume of business in 1955-56. On a numerical basis, 2,242 cooperatives had volumes of \$1 million or better in 1959-60 compared with 1,863 cooperatives in 1955-56. The new law provides for the formation of fishing cooperatives, fishery manufacturers cooperatives, and a central association of fishery cooperatives. Membership in the cooperatives is on a voluntary basis and no token stock investment is required. The selection of key officials and all operations are subject to close Government control. A majority of the financial support will come from the Government.

The Military Government of the South Korean Republic is committed to improving the welfare of the fishermen through co-operative action, and is aware of the great amount of educational work to be done in that area of cooperation among the Korean fishermen.

Note: See Commercial Fisheries Review, May 1962 p. 64.

**Malagasy Republic****JAPANESE AND CHINESE AID IN DEVELOPING TUNA FISHERY:**

A Japanese fishing company will train Malagasy fishermen in modern tuna fishing

techniques under the terms of a new cooperative agreement with the Government of the Malagasy Republic. The firm will also help set up tuna canning facilities at Majunga.



Fig. 1 - Fishermen on the southwest coast of the island fish between the coast and the large coral reef that runs parallel to it. Canoes in a semicircle chase fish towards nets off the beach. The fish hemmed in by the nets are speared.

The Government has also undertaken an experimental cooperative fishing venture with a Taiwan company. With the aid of the Chinese company, tuna canning has been started at Diego-Suarez for domestic consumption.



Fig. 2 - Mako shark (Isurus oxyrinchus) caught by research vessel Maru Atha.

Exploratory fishing has shown that the Mozambique Channel is suitable for Japanese and Chinese long-line tuna fishing techniques.

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Malagasy Republic (Contd.):

FISHERIES TRENDS:

Despite over 3,000 miles of coastline, salt-water fishing in the past has been limited to the efforts of a small group of tribesmen on the southwest coast. The tribesmen use small canoes equipped with sails, but usually hand-



Fig. 1 - Maran Atha, research vessel of Centre d' Oceanographie et des Peches. This vessel has explored for tuna off the northwest coast of Malagasy using Japanese long-line gear.

paddled. Fishing is done fairly close to shore. The catch is consumed in the fishing villages or sold to nearby villages. The tribesmen have no storage or transport facilities and their catch does not appear in inland markets.

Various shellfish are caught along the coast. They are mostly consumed locally, except for small amounts flown to Tananarive. Small canning and freezing operations planned or undertaken in the past have been unsuccessful. The Government has recently been engaged in exploratory shrimp trawling, lobster fishing, and tuna long-lining.



Fig. 2 - Workers at a Government pilot station on Lake Alaotra. The station was set up to smoke lake fish and produce fish meal, and fillet fish for smoking.

In contrast to salt-water fishing, fresh-water subsistence fishing is widely practiced in Malagasy. Fish are increasingly being recognized as a means of reducing protein deficiencies in the Malagasy diet. The Gov-



Fig. 3 - An entire family casts fishing lines into Lake Alaotra, Malagasy Republic.

ment carries on a program of fish farming and stocks the rivers and ponds with carp, black bass, tilapia, and many other varieties. Fishing techniques are very simple and the fresh-water catch is estimated at 12,000 tons annually. (United States Embassy, Tananarive, report of April 2, 1962.)

Note: See Commercial Fisheries Review, Feb. 1962 p. 85 and p. 93, Jan. 1962 p. 58.



Malaya

JAPANESE-MALAYAN TUNA BASE CONCENTRATING ON FROZEN TUNA EXPORTS.

The Japanese Overseas Fisheries Company (which manages the joint Japanese-Malayan tuna base, including a cannery) at Penang, Malaya, was granted by the Japanese Fisheries Agency, in December 1961, a quota of 36,000 cases of canned tuna in brine for export to the United States. Subsequently, in April 1962, the Agency designated Penang and Singapore as transshipment ports and allotted a 4,000-ton frozen tuna export quota to those two ports. In addition, the Agency authorized the Company to land, at Penang, 6,000 short tons of fresh tuna for freezing and transshipment to the United States.



Subsequent developments following the allocation of the above export quotas for canned tuna, frozen tuna, and fresh tuna to the Penang base indicate that the Penang base is now concentrating on transshipping clipper-caught Indian Ocean frozen tuna to the United States, suspending almost entirely the production of canned tuna in brine for export. Also, only small amounts of fresh tuna are being landed at Penang as a result of the Company's lack of success in attracting ice-carrying fishing vessels to fish out of Penang.

Apparently, under present operating conditions, the cannery at Penang cannot be operated at a profit, and Japanese tuna indus-

try members believe that the Malayan tuna base may eventually turn to the production of tuna loins for export to the United States. (*Suisan Tsushin*, July 19, 1962, and other sources.)

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FROZEN TUNA TRANSSHIPMENTS TO U.S. FROM PENANG AND SINGAPORE:

Transshipments of Indian Ocean frozen tuna to the United States from Penang (Malaya) and Singapore (the two ports which were designated as transshipment bases in April of this year and granted a combined export quota of 4,000 short tons) were reported proceeding smoothly as of July 10; transshipments totaled



Japanese fishery research vessel *Shoyo Maru* visited Penang, Malaya, early this year before going on a search for tuna fishing areas in the vicinity of Mauritius.

Indian Ocean Frozen Tuna Transshipments, April-July 10, 1962

Transshipment Port	Albacore	Yellowfin	Total
Penang	1,396.00	(Short Tons) 2,763.00	1,159
Singapore	114.16	235.84	350
Total	510.16	998.84	1,509

1/Includes 50 tons transferred from direct export (from Japan proper) quota.

2/Includes 20 tons transferred from direct export (from Japan proper) quota.

1,509 short tons. On the other hand, the fresh tuna quota of 6,000 short tons authorized landed at Penang for freezing and transshipment to the United States is not expected to be met. Conjecture is that by the end of the fiscal year (March 1963), fresh tuna landings at the Penang base may only reach somewhere between 1,000-2,000 short tons. The poor landings of fresh tuna are attributed in part to the fact that the Japanese Overseas Fisheries Company, which operates the tuna base at Penang, so far has not been able to attract more ice-carrying tuna vessels to its overseas base. However, by the end of September or by early October of this year, several ice-carrying fishing vessels are expected to un-

Malaya (Contd.):

load their catches at Penang. (Suisan Tsushin, July 11, 1962.)

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**TUNA FISHERMEN URGED TO
BRING CATCHES TO PENANG:**

Ex-vessel tuna prices paid at Penang were increased 10 to 20 percent in May 1962 by the Overseas Fisheries Company. The increase was announced by the Japanese firm which operates the joint Japanese-Malayan tuna-packing plant at Penang. Japanese tuna fishermen were later brought together by the Japanese firm, which explained its reconstruction plans for the Penang Base and asked for the fishermen's cooperation.

The firm requested that iced fish vessels bring their catch to Penang, and emphasized that the new prices were more than 20 percent higher than those at bases on the South Pacific islands. It was pointed out that those vessels could make the trip to the Penang base in about 25 days on the average, including the time required to unload the fish. (Suisan Tsushin, July 2, 1962.)

Note: See Commercial Fisheries Review, July 1962 p. 86.

**New Caledonia****TUNA CATCH QUOTA FOR
JAPANESE-FRENCH FISHING BASE:**

A Japanese fishing firm, who earlier this year filed an application with the Fisheries Agency to establish a joint Japanese-French tuna fishing base in New Caledonia, plans a catch quota of 10,000 tons. The firm plans to use some 30 tuna vessels. As soon as permission is received from the Fisheries Agency, the firm intends to begin fishing. The freezing of tuna at the base is to be a joint operation with the New Caledonia Development Public Corporation. (Suisan Keizai Shimbun, June 29, 1962.)

**Norway****MACKEREL SHARK FISHERY
OFF UNITED STATES WATERS:**

The Norwegian mackerel shark fishery in waters near the coast of America now appears to be entering a new phase.

Among the vessels now fishing, several are chartered by a Danish company and will land part of their catches in St. Pierre, near Newfoundland, and part in a Danish port. The plan includes Norwegian boats as well as two Faroese fishing boats, *Bakur* and *Hovikringur*. The Danish firm has agreed to export to Italian buyers 1,000 metric tons of frozen mackerel sharks from the Newfoundland fishing grounds. It is believed that the vessels which have contracted with the Danish firm will receive a price of 2-1/2 kroner a kilogram (16 U.S. cents a pound) for mackerel sharks landed in St. Pierre, and 3 kroner a kg. (19 cents a pound) for fish landed in Denmark.

Norway's Mackerel Shark Fishermen's Sales Association (Habrandfiskernes Salslag) is familiar with this situation and has brought the matter to the attention of the Norwegian Fisheries Department.

The cause for this concern may stem from the course that the market for mackerel shark from Norway took in 1961, after the large landings of frozen mackerel shark from the waters off America. This concern developed after a Danish vessel last winter began mackerel shark fishing in the "North Atlantic Ocean." The fishing grounds were described that way in the newspapers in an attempt to camouflage the information concerning the fishing area. Actually, fishing extended to the waters east of New York.

According to some reports, there is exceptionally good mackerel shark fishing off the American Coast. When the Norwegian mackerel shark vessels had fished for 14 days, they had obtained full loads.

There has been apprehension that the supplies of mackerel shark in Norway might depress the market and lead to a collapse. It now seems that by contracting their boats to the Danish firm, the Norwegian vessels have avoided the problem of landing in Norway; consequently, the matter is put in an entirely different light. Norway exported about 1,200 tons of mackerel shark each year in 1959-60 with Italy the principal buyer. Exports were far less than that in the years previous to 1959, but averaged about 2,000 tons shortly before and immediately after World War II. The Italian market is sharply limited, and Norway has competition from Japan and France. It is assumed that a quantity of 1,000 tons of frozen mackerel shark from Denmark will also influence the selling conditions for fresh mackerel shark from Norway and the price for Norwegian mackerel shark in general.

The Danish firm has apparently contracted for the landing of a quantity of mackerel shark that exceeds slightly the Norwegian export quantity, except for 1959-60. If the Italian market is provided with such a quantity, it will not need imports from Norway. The Mackerel Shark Fishermen's Sales Association will then become only an historical group.

There is a good possibility that the demand for mackerel shark in the Italian market may be somewhat more than is now believed. The supplies in the years before World War II suggest it. But it is likely that this additional demand in later years was met by Japanese suppliers. (Fiskaren, 39 arg., no. 21, p. 5.)

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**FOREIGN MINISTER PRESENTS
DECLARATION ON MEMBERSHIP IN EEC:**

Norway's declaration in connection with its application for negotiations on full membership in the European Economic Community (EEC) was presented before the EEC Council of Ministers at Brussels on July 3, 1962. It was agreed at the meeting that actual negotiations would start this fall.

"The Norwegian Government," the Foreign Minister stated, "desires to contribute to the

Norway (Contd.):

development of a closer economic and political cooperation in Europe. Such a cooperation could strengthen Western unity and act as a stimulant for world trade, not least in relation to the developing countries. He added that "The Norwegian Government agrees with the objectives and the measures outlined in the Treaty of Rome. It believes that an expanded EEC can create new prerequisites for solving the special problems in each member country."

A major part of the declaration described the peculiar problems that EEC membership would entail for Norwegian farming and fishing. The cost of many agricultural products in Norway is relatively high and the trend is toward the creation of larger and more economic operating units. It was stressed that rationalization of Norwegian agriculture must be carried out over a long period lest it inflict permanent damage to the social structure in rural communities. The Foreign Minister said, "The special conditions of Norwegian agriculture, together with the social interest of maintaining essential farm settlements and farm production, require special solutions that necessitate special measures. The Norwegian Government believes it is feasible to find these solutions, within the framework of the Treaty of Rome."

The Norwegian Foreign Minister said his Government also assumed that Norway, as the largest European exporter of fishery products, would have an opportunity to participate in discussions on formulation of a common fisheries policy for EEC. Moreover, in light of the special conditions that prevail along the Norwegian coast, Norway would request discussions of the Rome Treaty provisions on the rights of establishment and the problems that these might create for Norway's fishing industry.

As Norway sees it, a common fisheries policy should recognize the necessity of regulations to protect fish stocks against overexploitation, facilitate the development of stable markets for high-quality fish at reasonable prices, and assure adequate living conditions for fishermen. (News of Norway, August 16, 1962.)

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ONLY FOUR FLEETS TO PARTICIPATE IN 1962/63 ANTARCTIC WHALING:

Norwegian whaling companies, after an extended period of indecision, announced that they would participate in the 1962/63 Antarctic whaling season.

Four Norwegian expeditions are to take part in the 1962/63 whaling season as against seven expeditions using 71 catcher boats the previous season. Two whaling factory ships have been withdrawn permanently, in accordance with an agreement between the Norwegian whaling companies. The four factory vessels (Thorshavet, Thorshovdi, Kosmos IV, and the Sir James Clark Ross) are all registered at Sandefjord, the main port in the Province of Vestfold.

The lower number of whaling expeditions for 1962/63, together with an even bigger reduction in the number of catcher boats, will probably mean that the Norwegian quota of 4,200 blue-whale units cannot be fulfilled. The total catch by seven expeditions during the 1961/62 season amounted to less than 3,700 blue-whale units, as against the original quota of 5,100 units.

Of the 4,557 Norwegian crew members who took part in the 1961/62 Antarctic whaling, 2,850 came from Vestfold. In the coming season, the number from Vestfold will be cut down to about 2,200. The cutback, it was believed, would be felt in the traditional whaling districts which have derived a considerable part of their income from the Antarctic whaling operations. This is true in spite of the trend in recent years that nearly half of the whaling crews give up sailing at the end of the season and take jobs in the Norwegian merchant fleet, or in factories.

During the 1961/62 season, the seven expeditions paid nearly 50 million kroner (US\$7 million) for wages, about 21 million kroner (\$2.9 million) for repairs, and some 30 million kroner (\$4.2 million) for outfitting.

The decision to take part in Antarctic whaling next season was reached despite the large quantity of unsold whale oil (estimated to be about 29,000 tons) and the poor prospects for future profitable operations. Norway's whaling companies have operated with little or no profit during the past few years because of the weak market for whale oil. The market price for whale oil during the

Norway (Contd.):

summer of 1962 was £40 (about US\$112) a long ton (about 5.0 U. S. cents a pound), with unsold stocks in Norway then at about 30,000 tons. The only encouraging sign in the whaling picture for Norway was reported to be in the newly-developed market for frozen whale meat in Japan. In the 1961/62 Antarctic season, the whale meat production of one of the Norwegian expeditions surpassed the oil production in value.

The Norwegian Government served notice on December 29, 1961, of its conditional withdrawal from the International Whaling Convention, because it was not certain whether the conditions for Norway's continued adherence to the Convention could be fulfilled. The withdrawal was to be cancelled as soon as an agreement on distribution of the international whaling quota was signed by the five whaling nations prior to July 1, 1962. (United States Embassy, Oslo, August 6, 1962, and News of Norway, August 16, 1962.)

Note: See Commercial Fisheries Review, Aug. 1962 p. 85, Feb. 1962 p. 88.



Pakistan

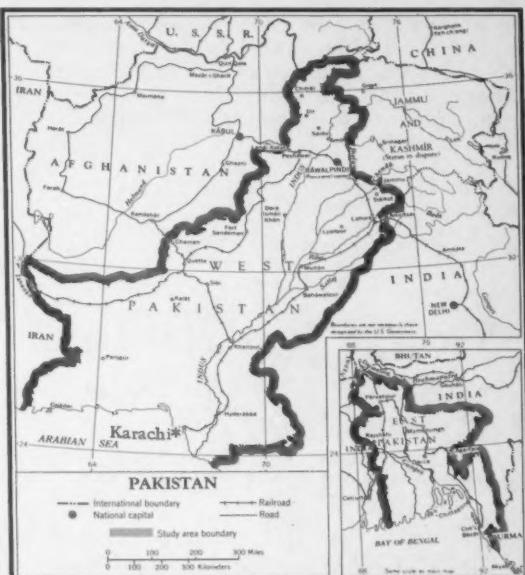
UNITED STATES FIRMS INVITED TO AID GOVERNMENT IN DEVELOPING FISHERIES:

Pakistan's Ministry of Food and Agriculture (Agriculture Division) invites interested firms in the United States to submit proposals for joint United States-



Baskets of small fish ("kakra") brought ashore at Ibrahim Hydari, small fishing village 11 miles from Karachi.

Pakistani commercial fishing ventures. It is believed that waters off the coast of Pakistan are rich in fish and shellfish. The fishing industry along the coast of Pakistan is not well developed, although modern facilities for handling fish have been established at Karachi harbor.



It is understood that Pakistan needs the services of technicians who can offer the Government a detailed plan for the exploration of their fish wealth. Technicians are also needed who can show them how to operate an exploratory fishing vessel and its gear.

Pakistan wants to obtain an exploratory fishing vessel of about 70 gross tons or more. The vessel should be equipped for shrimp trawling and should also be equipped to purse seine for sardines, mackerel, and threadfin. Pakistan may want to purchase additional fishing vessels and gear.

Initially fishing would be confined to waters off West Pakistan and would be aimed at locating shrimp breeding areas. But the Government is also interested in exploratory fishing in the Arabian Sea and in the Bay of Bengal adjoining East Pakistan. (United States Embassy, Karachi, June 28, 1962.)



Panama

VESSEL CHARTERED FOR SPINY LOBSTER EXPLORATIONS:

The U. S. Bureau of Commercial Fisheries contracted with the U. S. Agency for International Development (AID) on June 20, 1962, to conduct a spiny lobster survey in the waters along the east and west coasts of Panama. The purpose of the survey is to determine the potential of the spiny lobster fishery, and to assist the Panamanians in the development of the resource if the potential shows promise.



Fig. 1 - Full starboard view of the M/V Pelican at the dock in Jacksonville prior to the vessel's departure for Panama.

The vessel Pelican was chartered from a private firm for that purpose. The Bureau is to provide the Master for the vessel and some of the equipment. All other personnel, material, supplies, and other equipment is to be furnished by AID.



Fig. 2 - Partial view of the wheelhouse showing instrumentation, including radar.

The survey will take 14 months to complete, and the responsibility for performance under the contract was assigned to the



Fig. 3 - Hydraulic lobster pot hauling block.

Bureau of Commercial Fisheries Region 2, St. Petersburg Beach, Fla. The Bureau's Exploratory Fishing and Gear Researchbase at Pascagoula will exercise general supervisory authority over the survey work.



Peru

FISHERIES TRENDS, SECOND QUARTER 1962:

The Peruvian fishing industry continued to expand during the second quarter of 1962. According to industry data total exports of all fishery products amounted to 559,771 metric tons during the first half of 1962, up 27.7 percent from fishery products exports of 436,790 tons during the same period of 1961. Data are not available on the quantity of fish meal produced and exported during January-June 1962. But fish meal exports on the average account for about 85 percent of Peru's total exports of fishery products. (Editor's note: According to reports submitted to the International Association of Fish Meal Manufacturers, Peruvian fish meal production January-May 1962 amounted to 460,623 metric tons.)

The value of fish meal exports during the first quarter of 1962 was 845 million soles (US\$31.5 million), over three times greater than the value of fish meal exports during the same period of 1961.

Value (f.o.b.) of Peru's Exports of Fish Meal, First Quarter 1960-62					
January-March					
1962		1961		1960	
Million Soles	US\$ 1,000	Million Soles	US\$ 1,000	Million Soles	US\$ 1,000
845.0	31,506	260.1	9,705	360.2	13,004

Note: Values converted at rate of US\$1 equal 26.82 soles in the first quarter of 1962; 26.80 soles in the same period of 1961; and 27.70 soles in the first quarter of 1960.

During the first quarter of 1962 exports of fish meal led all other Peruvian commodity exports in value, and fish oil exports ranked ninth. Heavy stocks of fish meal carried over from 1961 partly accounted for the unusually large shipments in the first quarter of 1962. Fish meal exports

Peru (Contd.):

during the second quarter were not as large as in the first quarter. But industry representatives estimate that fish meal exports for the full year 1962 will be over a million tons, possibly 1.2 million tons. In 1961, fish meal exports amounted to 760,619 tons according to industry data (Government statistics show 1961 fish meal exports as 708,366 tons).

Peruvian fish meal producers enjoyed a strong world market demand for their products in the first half of 1962. During the first quarter of 1962, fish meal export prices averaged about US\$82 per metric ton, 31.4 percent above the average export price of \$70 per ton in 1961. European demand increased due to poor crops of animal feedstuffs in many continental areas. Reduced competition from other fish meal producing countries which continue to experience low production also helped create a favorable market for Peruvian fish meal. The present good returns to Peruvian fish meal producers have spurred substantial additional interest in investment in fish meal plants. It is understood that 72 applications for licenses to establish new fish meal plants along the Peruvian coast were submitted during the first half of 1962 and 38 have been granted. But construction of new plants in the Lima-Callao area has been prohibited.

A constantly increasing number of fishing vessels of larger size and capacity, permitting access to fishing grounds farther from the coast, is expected to supply enough anchoveta for the potential increase in production. There seems to be no concern that there will be overfishing of anchoveta in Peruvian waters. Also, there appears to be little concern that there will continue to be a profitable market for the increased production of fish meal expected in the future.

The Consorcio Pesquero del Peru, S. A. (Fisheries Consortium of Peru) is the marketing agency for a large percentage of Peru's fish meal production. It has been reported that the Consortium is working to expand its membership through broadening the advantages its marketing organization can offer. The Government may even require producers, especially those entering the industry, to become members. In the second quarter of 1962, producers in the Consortium accounted for 82 percent of total fish meal production. (United States Embassy, Lima, July 26, 1962.)

**South Africa Republic****TUNA FISHING DEVELOPMENT OPPORTUNITIES:**

There is a constantly growing interest within and without the South African fishing industry in the possibilities of developing an important tuna fishing industry in South Africa. This industry is thought of as an export industry; emphasis is almost entirely on catching and freezing tuna for export to Italy, Yugoslavia, and the United States. The market potentialities must, therefore, be measured in terms of the world market for tuna.

In South Africa there are groups interested in exploiting the tuna possibilities. Aside from rod-and-line fishing from pleasure boats, tuna fishing to date has been done in the pilchard off-season with wooden pilchard boats and Japanese long-line gear. The Fisheries Development Corporation, a Government-sponsored body, has equipped one pilchard boat with a tuna purse seine and power block, but tests have only just started and cannot be evaluated yet.

According to investigations of the South Africa Department of Fisheries and the findings of two other firms or groups of companies, tuna is abundant in South African waters. There were about 400 metric tons of tuna caught in

1961. The estimate for 1962, based on present catches, is 3,000 tons. Catch of one boat in early August was 4 tons per day. Catch of another boat in one morning's set was 3.5 tons. The boats are 50 to 60 feet, and fishing is with Japanese-type long lines.

The tuna presently caught by long lines brings the following prices at the dock: Price to boat owners who borrow equipment from factory and receive ice and bait is \$57.14 a ton. Price to boat owners who have their own equipment, ice, and bait is \$85.50 a ton. The boat owner pays crew \$25.71 a ton. The fish is weighed after head, fins, and entrails are removed. In 1961 about 400 tons of tuna were caught.

A South African canning and fishing company is interested in obtaining financial and technical assistance from United States tuna industry interests for establishing a tuna fishing enterprise in South Africa. Registered in 1953 as a proprietary company with an authorized capital of R200,000 (\$280,000) of which R129,100 (\$180,740) have been paid in, the firm operates a fish cannery factory at St. Helena Bay, about 80 miles north of Cape Town. The cannery employs 100 workers during the season, November-July. The firm owns two fishing vessels (67-foot wood pilchard boats); is engaged in the catching and canning of pilchards, jack mackerel and true mackerel; production of fish meal and oil; produces a certain amount of dried shark and shark fins; and handles spiny lobster for the local market. Since there is very little room for expansion in the present fishing activities of the firm because they are pegged at their present limits, the firm seeks to enter other types of fishing, such as tuna.

The firm's Managing Director points out that since the long-line method is not the most economical one for tuna, it would be desirable to use purse seines. But since that method needs bigger boats, expensive nets, and a good bit of know-how, the firm envisages to form a subsidiary company for tuna fishing with participation of a United States firm who could bring in some, perhaps 50 percent, of the capital, as well as the necessary experience in purse seining. The type of return envisaged is a share in the equity of the subsidiary company to be formed, up to 50 percent. Investor would be at liberty to share in the management in accordance with his financial interest.

The type of purse seiner used in the United States west coast tuna fishery could be built cheaply in South Africa, but power blocks and nets would have to be imported. There is no import restriction on necessary equipment for the fishing industry and so there is no reason to think that there would be any obstacles in the way of equipping such a vessel. Harbor facilities, including drydocking and marine railways, are adequate and there are plenty of highly-skilled fishermen who would be available to man the vessel.

* * * *

PILCHARD-MAASBANKER FISHERY, JANUARY-MARCH 1962:

The Republic of South Africa cape west coast pelagic shoal fishery for the first three months of 1962 totaled: pilchards 283,613 short tons, maasbunker 4,451 tons, and mackerel 9,207 tons. The total catch was 297,271 tons.

The catch in March 1962 was: pilchards 94,775 tons, maasbunker 3,175 tons, and mackerel 3,020 tons. The total March catch was 100,970 tons. In March 1961 the catch was: pilchards 64,698, maasbunker 4,145 tons, and mackerel 3,663 tons; a grand total of 72,506 tons. In 1960 the total catch in March was 84,327 tons.

South Africa Republic (Contd.):

The March catch this year yielded: fish meal 24,001 short tons, fish body oil 1,793,903 Imperial gallons, canned pilchards 2,244,576 pounds, canned maaibanker 1,681,152 pounds, and canned mackerel 1,333,776 pounds. (The South African Shipping News and Fishing Industry Review, May 1962.)



South-West Africa

FISHERY TRENDS FOR 1961:

Although landings increased, the value of fishery products manufactured in South-West Africa declined in 1961. The record catch of 378,032 short tons of pilchard and maaibanker was 21.9 percent above the amount landed in 1960. Spiny lobster landings in 1961 of 6,361 short tons increased 48.7 percent over 1960. But the total value of manufactured fishery products, estimated at 22,753,000 S.A. rands (US\$31,854,000), was down 9.0 percent from 1960. The value declined because the pack of canned pilchards in 1961 was much smaller than the pack in 1960. The decline in value was partly offset by an increase in the value of the production of frozen spiny lobster tails and fish meal.

In addition to pilchards and spiny lobsters, a total of 1,912 short tons of whitefish, snoek, and other finfish were landed in 1961.

Item	Production	
	1961	1960
Pilchard:	... (Short Tons) ...	
Canned	76,875	114,034
Meal	77,735	55,122
Oil	19,710	16,694
	... (1,000 Lbs.) ...	
Spiny Lobster:		
Canned	306.4	399.4
Frozen tails	3,027.8	1,060.0
Meal	1,330.4	2,029.4

In 1961, production was higher for fish meal (up 41.0 percent) and fish oil (up 18.1 percent). But the pack of canned pilchards was 32.5 percent below the pack in 1960. Heavy stocks of canned pilchards were on hand at the beginning of 1962 even though Walvis Bay cannery severely restricted the pack in 1961. Only part of the canned pilchard pack had been sold by July 1962. During 1961 fish meal prices improved, but fish oil prices declined.

The pack of frozen spiny lobster tails in 1961 was almost three times as large as the pack in 1960. Higher prices were received for the larger pack in 1961 because the demand continued to exceed the supply.

The amount of pilchards that may be landed in South-West Africa during 1962 has been raised to 435,000 short tons, an increase of 16 percent over the 1961 quota. (United States Embassy, Capetown, report of June 25, 1962.)

Notes: One South African rand equals about US\$1.40.
Also see Commercial Fisheries Review, May 1962 pp. 68-70; July 1961 p. 87.



Spain

VIGO FISHERIES TRENDS,
SECOND QUARTER 1962:

Landings: Fish unloaded at the port of Vigo, Spain, during the second quarter of 1962 was 65.6 percent more in weight and 30.3 percent higher in value than during the first quarter of the year, and 4.9 percent more in quantity and 20.6 percent higher in value when compared with the second quarter of 1961. The average price per kilo for the second quarter of 1962 was 10.38 pesetas (7.8 U.S. cents a pound) compared with 13.24 pesetas (10 cents a pound) for the first quarter of 1962, and 9.04 pesetas (6.8 cents a pound) for the second quarter of 1961.

The much higher landings of octopus and horse mackerel, and the fairly good start of the albacore fishing season were mainly responsible for the increased landings in the second quarter of 1962. The price of albacore started to increase as the season advanced because of the heavy demand from fish canners who were anxious to make up for the poor sardine season. Albacore and sardines are the basic species for the export market of canned fish.

Table 1 - Fish Handled by the Vigo Fish Exchange, Second Quarter 1962 with Comparisons

Period	Qty.	Value		
		Metric Tons	1,000 Pesetas	US\$ 1,000
1962:				
April-June	18,322	190,409	3,173	
January-March	11,065	146,117	2,435	
1961:				
April-June	17,461	157,931	2,632	

Table 2 - Utilization of Fish Landed at Vigo Fish Exchange, Second Quarter 1962 with Comparisons

Period	Shipped Fresh to Domestic Mkts.	For Canning	Other Processing (Smoking, Drying, Fish Meal, etc.)	Local Consumption
			(Metric Tons)	
1962:				
2nd. Qtr.	9,636	1,830	6,043	813
1st Qtr.	8,624	565	1,160	716
1961:				
2nd. Qtr.	10,948	1,302	4,440	771

Vigo's landings during April 1962 amounted to 5,804 metric tons with an ex-vessel value of 64.7 million pesetas (US\$1.1 million) as compared with 5,831 tons valued at 52.0 million pesetas (\$0.9 million) in April 1961. In May, 5,938 tons were unloaded valued at 54.9 million pesetas (\$0.9 million) as against 6,410 tons and 56.6 million pesetas (\$0.9 million) in May 1961.

The lower landings for May 1962 were caused by a decrease in catches of the following species: small hake 1,028 tons in May 1961 as against 549 tons in May 1962; pomfret 200 tons in May 1961 and 6 tons this May; sardines 378 tons in May 1961 and 207 tons in May this year; and horse mackerel 886 tons in May 1961 and 793 tons this May. Increases in other species, such as octopus, sea bream and cuttlefish, were not large enough to offset decreases in catches of major species.

The lifting on April 15 of the conservation fishing ban on sardines did not help as catches of that species continued

Spain (Contd.):



light through most of the second quarter. The price of sardines at the fish exchange increased from 4.19 pesetas a kilo (3.16 U.S. cents a pound) ex-vessel in April 1961 and 4.99 pesetas (3.76 cents a pound) in May 1961, to 6.87 and 5.96 pesetas (5.19 and 5.27 cents a pound) in April and May 1962. Price increases were also reported for other species.

Canning: The fish canning industry was fairly active during the second quarter of 1962, in spite of lack of commercial species and high costs. Sardine catches were not as abundant as expected, and the prices were high. The albacore fishing season, which started about the middle of June accounted for limited catches only, and the prices also were high. Octopus and shellfish (mainly mussels) made up the bulk of the packing at fish canning plants during the period.

A collective agreement was being discussed for the fish canning industry. Unconfirmed reports indicated that minimum wage increases of about 30 percent will be granted by the agreement. Since this industry is dependent upon labor to a very large extent, it is easy to foresee a substantial increase in production costs, which will inevitably be reflected in the price of the finished product. Prices of Spanish canned fish in the international market are already higher than those for similar products from other countries--Portugal, Morocco, and Japan, in particular--and exporters are apprehensive for their foreign trade prospects.

Also contributing to high production costs is the price of tinplate (which is estimated as a 30-60 percent factor of the total costs). Spanish tinplate costs about 1,720 pesetas (US\$29.00) per 190-pound case. Imported tinplate is obtained at around 1,150 pesetas (US\$19.00) f.o.b.; transportation costs and entrance duties (30-percent customs duties plus 12-percent fiscal tax) bring the price of imported tinplate to the level of domestic tinplate. A reduction of 15 percent in customs duties has been requested by the canning industry. About 60,000 metric tons of tinplate are imported each year. The prospects are for an increase in Spanish tinplate production to about 100,000 tons by 1963, when the needs of the canning industry will be around 140,000 tons. The problem of tinplate prices seems to be a long-term one.

Table 3 - Landings and Average Ex-Vessel Prices of Principal Species at Vigo Fish Exchange

Species	April-June 1962			January-March 1962			April-June 1961		
	Qty.	Average Price		Qty.	Average Price		Qty.	Average Price	
	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.
Octopus	5,763	3.09	2.3	1,711	4.44	3.4	3,249	3.23	2.4
Horse mackerel	2,627	4.34	3.3	1,662	6.00	4.5	2,391	2.71	2.0
Hake, small	2,176	25.58	19.3	2,794	23.07	17.4	2,973	19.84	15.0
Sardines	777	7.21	5.5	105	7.93	6.0	1,411	5.20	3.9
Sea bream	552	11.76	8.9	424	18.95	14.3	237	10.74	8.1
Hake, large	493	46.62	35.2	145	59.16	44.7	238	45.45	34.4
Albacore	453	25.37	21.4	-	-	-	188	23.04	17.4

Albacore Tuna Fishing: The albacore tuna fishing season started during the last week of June. The catches were reported to run higher than during the first days of the 1961 season. Prices at the fish exchange averaged 25-30 pesetas a kilo (18.9-22.7 cents a pound) as compared with an average of 23.04 pesetas a kilo (17.4 cents a pound) in 1961. In the opinion of some fishermen, the fishing for the season started too late, since albacore were found close to Vigo Bay and they will probably have proceeded in their migration beyond the range of local fishing vessels before full advantage could be taken of the season.

La Coruna Fishing Port: Improvements are being planned for the La Coruna fishing port, second in importance in Galicia. The new facilities will include a 3,100-foot pier, fish exchange, post office, telephone and telegraph, banking and other services. The plan is designed to attract fishing vessels from other ports to La Coruna, and to take full advantage of the increased capacity of the fishing fleet under the new "Law for the Renovation of the Spanish Fishing Fleet."

Cod: Some of the fishing vessels that sailed to Newfoundland for the cod fishing season in January had returned. Cod catches were less than satisfactory, but data are not available as the fish were landed at several ports in Galicia.

At least one local fish cannery is experimenting with aluminum as a substitute for tinplate with some success, especially for the more delicate products such as shellfish, and other fish in which olive oil is not used. It will, however, be some time before aluminum replaces tinplate in the local canneries as the price is still higher than tinplate, and new machinery will have to be installed. Some Portuguese fish canneries are already using aluminum.

Canned Fish Exports: Exports of canned fish from Vigo dropped considerably during the second quarter of 1962. Although complete figures are not available, it is estimated that exports during the period April 21-May 20, 1962, were about 30 percent of the amount exported during the same period of 1961.

Table 4 - Canned Fish Exported from Vigo, January-May 1962

	Quantity	Value	Metric
			Tons
1962:			
April 21 - May 20	319	194,652	
February 21 - March 20	586	396,261	
January 21 - February 20	915	607,156	

Septe:

Spain (Contd.):

Lack of commercial species and high prices were given as the main reason for the continued drop in exports, following the high level maintained through the second half of 1961 and early 1962. (United States Consulate, Vigo, report of July 6 and 16, 1962.

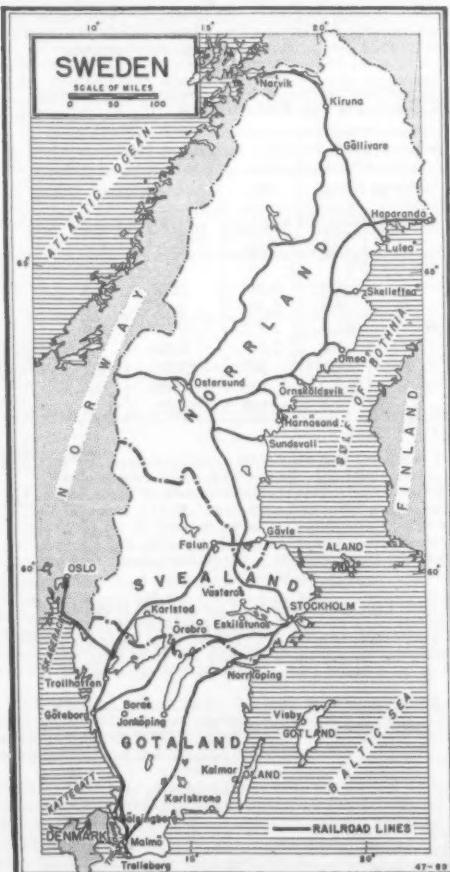
Note: Values converted at rate of 60.00 pesetas equal US\$1.00.



Sweden

FISHING GEAR ATTACHMENT FOR SIMULTANEOUS TROLLING AT DIFFERENT DEPTHS:

A recent development in trolling or line fishing is the Swedish "surfing" paravane manufactured in Goteborg, Sweden. It is claimed that by using 3 or 4 paravanes, fish



can be taken at the same time at different depths.

An illustration of the "surfing" paravane shows a device with two fins sticking out of one side of a round ball. The vertical fin is set on the plane of the horizontal fin. (Editor's note: The paravane appears to have some relation to the familiar trolling "dodger" widely used in salmon trolling. It looks like a "dodger" might look if one end of the "dodger" were inserted in a ball and a vertical fin was then attached to the top side of the "dodger.") Both the vertical and the horizontal fin have sets of holes. Trolling depth can be varied by fastening the line in different holes of the vertical fin of the paravane, by the speed of the boat, by the length of line, and by the size and weight of the bait. Lateral control is provided by the horizontal fin. The surfing paravane signals a bite by surfacing, unless a heavy bait is used.

There are 3 models of the paravane. Model No. 43 is for small fish such as mackerel and trout. Model Nos. 50 and 60 are for large fish such as salmon, kingfish, barracuda, dolphin, and tuna. Using model No. 60, a fisherman can troll to a depth of 90 feet. A greater depth can be reached by using 2 model No. 60's. (World Fisheries Abstracts, April-June 1962; Australia's Fisheries Newsletter, November 1961.)



Taiwan

FISHERY LANDINGS UP IN 1962:

Taiwan's fishery landings in the first 6 months of 1962 were estimated at 166,400 metric tons, a 10.5-percent increase from the first half of 1961. The growth of Taiwan's fishing fleet is largely responsible for the increased landings during the past few years, as well as the Government's efforts to modernize and expand the fishing industry. Two 550-ton tuna vessels constructed in Japan were delivered to a Taiwan fishery firm early in 1962, and 12 additional tuna vessels of 145-ton capacity, which were being constructed locally with United States aid funds, were due for delivery in September.

The Tawain Government's success in expanding its fishing industry apparently has exceeded the consumption capacity of the local fishery marketing and processing indus-

Taiwan (Contd.):

tries. During June 1962, a total of 17 private fishing companies petitioned the Taiwan Fisheries Bureau to take action to relieve the offshore fishing industry from overexpansion and overproduction, both of which had contributed to a drop in the market price of fish. During the second quarter of 1962, the average wholesale price of fish dropped by about 30 percent as compared with the corresponding period in 1961. The Taiwan Fisheries Bureau was then somewhat inclined to discount the complaint of the fishing industry but an industry-wide conference was planned for July to review the industry's problems. The possibility of placing a limitation on the number of operating trawlers, finding new fishing grounds, improving the method of fish handling and marketing, reducing operating costs of the fishing industry, and expanding the fish processing industry were items up for discussion at the meeting. The problems were considered domestic primarily, and were not believed to affect Taiwan's deep-sea fishing industry.

The Taiwan Government also held a fish products processing seminar to discuss promotion of export sales of frozen fish. In June, the Kaohsiung Fisheries Association in Taiwan contracted to supply 30 tons of frozen dolphin and 80 tons of frozen tuna to Japan at about US\$300 a ton f.o.b. Taiwan. It was believed that this fish would be re-exported to the United States. There were some reports that Japanese firms were anxious to sign long-term contracts for the supply of frozen tuna to Japan. The Taiwan Fisheries Bureau stated it was more interested in finding direct outlets in the United States, or other markets instead of to Japan. (United States Embassy, Taipei, report of July 31, 1962.)



U.S.S.R.

FISHING FLEET ON
GEORGES BANK, JUNE 1962:

During the third week in June 1962, the Soviet fishing fleet on Georges Bank in the North Atlantic numbered 169 vessels. The fleet consisted of 164 trawlers and gill-netters, a seagoing repair tug, and 4 motherships. This is approximately the same number of Soviet vessels as were in the area in



Russian drifter (gill-netter) fishing on the "Northern Edge" of Georges Bank.

late May. Herring was the major species being taken. (Unpublished sources.)

* * * * *

FISHING IN GULF OF ALASKA,
JUNE-JULY 1962:

In a period of six weeks beginning in mid-June 1962, the Soviet fleet in the Gulf of Alaska increased to 107 vessels, consisting of 89 trawlers, 8 freezer ships, and 7 support ves-



Russian king crab factoryship Andrey Zakharov, operating in Bering Sea, July 5, 1961.

sels, such as tugs, tankers, and cargo ships. The fleet, using midwater trawls, was catching mostly Pacific ocean perch and some sablefish. No halibut or other bottom fish were reported taken. The fleet was gradually moving eastward and was last reported late in July in the vicinity of Chirikof Island. (Unpublished sources.)



United Kingdom

BRITISH FISHERIES TRENDS, 1961:

Landings: White fish landings by British and foreign vessels in the calendar year 1961 amounted to 780,022 metric tons, down 3.1 percent from landings in 1960. But the ex-vessel value of those landings in 1961 was slightly above that of the larger catch one year earlier.

United Kingdom (Contd.):

Great Britain's White Fish Landings, 1961-60			
Year	Quantity	Ex-Vessel Value	
		Metric Tons	Million £
1961	780,022	61.3	171.6
1960	805,028	60.7	170.0

Note: The term "white fish" excludes pelagic fish and shellfish.

A drop of 5.3 percent in white fish landings by British vessels was partly offset by an increase of 10.3 percent in white fish landings by foreign vessels.

The decline in landings by British vessels in 1961 was mainly due to reduced rates of catch on almost all fishing grounds by near- and middle-water trawlers. Landings by that fleet in 1961 were down 13 percent even though the fleet increased. A total of 70 new vessels came into service and 58 were scrapped that year. At the end of 1961 there were 514 trawlers in the fleet as against 502 at the end of 1960. The fall in the rates of catch by near- and middle-water trawlers was most severe for English and Welsh trawlers, but it created a serious operating problem for all owners.



Fig. 1 - Distant-water trawler getting ready to dock at Grimsby, England.

Landings by the British distant-water fleet in 1961 of 359,500 tons were down slightly from the previous year. Landings by the distant-water fleet were sustained by an increase in fishing by grant-aided trawlers. The rate of catch fell in all of the main distant-water fishing areas except Bear Island. The decline in the rate of catch was partly due to increased fishing by the less powerful grant-aided trawlers. The average value of the distant-water catch in 1961 was 65s. 4d. per hundredweight of 112 pounds (8.17 U. S. cents a pound) as compared to the average value in 1960 of 62s. 7d. per hundredweight (7.82 cents a pound). The quantity not sold at or above the minimum price and used for fish meal was just less than 6,000 tons in 1961 as compared with 7,000 tons in 1960. The number of vessels in the distant-water fleet at the end of 1961 was 228, one less than at the end of 1960. Five new Diesel-powered vessel (including a stern trawler designed to freeze part of her catch at sea) came into service in 1961. In 1961, British yards had ten vessels under construction for the distant-water fleet, includ-



Fig. 2 - Wharf buildings and locks leading to inner harbor, Grimsby, England.

ing one stern trawler designed to freeze her entire catch at sea.

The number of Scottish seiners fell by 56 during 1961, but the fleet accounted for 45 percent of Scottish landings. There was a small increase in the number of English seiners, but their catch declined slightly in comparison with the previous year.

The inshore catch (excluding shellfish) in 1961 was down about 1 percent in quantity and 1.5 percent in value from the previous year. Landings in Northern Ireland recovered from the previous year's low level. Shellfish landings again showed an increase in value—from £2,078,739 (\$5,820,469) in 1960 to £2,376,918 (\$6,655,370) in 1961, due mainly to an increase in the catch of lobsters and Norway lobsters in Scotland.

Aid For Fishing Industry: The White Fish Authority for the fiscal year ending March 31, 1962, showed a deficit of £17,578 (US\$49,218) and the accumulated surplus of the Authority's funds was reduced to £187,183 (\$524,112). This was revealed in the annual report of the White Fish Authority which was published in July 1962. The deficit was mainly due to increased outlays for research. The report stated that for the current year the deficit is likely to be £100,000 (\$280,000) due largely to the cost of additional research. For this reason initial steps were taken to raise the general tax from $\frac{1}{4}$ d. per stone (4.16 U. S. cents for 100 pounds) to 1d. per stone (8.33 U. S. cents for 100 pounds).

The net amount outstanding as of March 31, 1962, on loans made by the Authority for new vessels, motors, nets and gear, improvements, and processing plants was over £22.0 million (\$61.6 million). Past due loans became a problem for the first time during 1961. The amount in arrears reached £417,467 (US\$1,168,908) on May 14, 1962, and placed a heavy burden on the Authority's funds. But it was still possible to meet the half-yearly repayment of £1.4 million (\$3.9 million) to the Treasury on April 30.

The Authority applied a policy of restraint in 1961/62 in approving assistance for building new near- and middle-water vessels. Grants and loans were approved for only six trawlers and one large vessel. From the beginning of the program in 1953 through March 31, 1962, the Authority had assisted 356 near- and middle-water vessels. Total assistance to the near- and middle-water fleet had amounted to almost £33.5 million (\$93.8 million); over £9.5 million (\$26.6 million) in grants and almost £24.0 million (\$67.2 million) in loans.

Only 29 coal-burners were left in the fishing fleet at the end of March 1962, as compared with 87 a year earlier. When the coal-burners have all been scrapped and the vessels now being built have come into service, the size of the near- and middle-water fleet will be two-thirds of the total at the end of 1953.

The Authority examined applications for building new inshore vessels in 1961/62 more rigorously than when modernization was less advanced. In the case of seiners emphasis was on replacement. Only 52 grants for inshore vessels were approved in 1961/62 as compared with 73 in the previous year. Approvals for new motors in 1961/62 amounted to 45, about the same as in the previous year. Through March 31, 1962, the Authority had approved 819 grants for new inshore vessels and 507 grants for new motors. Financial assistance had amounted to over £7.5 million (\$21.0 million); about £2.5 million (\$7.0 million) in grants and £5.0 million (\$14.0 million) in loans.

United Kingdom (Contd.):

In accordance with the broad policy set out in the Government's White Paper on the fishing industry, issued in August 1961, the Ministers have informed the Authority of the arrangements which they desire should be adopted in administering grants for new trawlers of 80 feet and over under the scheme to be presented to Parliament under the Sea Fish Industry Bill. The trawler owners organizations and the Authority were consulted on and concurred in the arrangements.

The arrangements provide that new grant-aided trawlers should genuinely displace older vessels (i.e. pre-war distant-water vessels and near- and middle-water trawlers built without grant) roughly on the basis of one new ton for every two old tons. The Authority should satisfy themselves that the old tonnage was scrapped. Some limited relaxations could be made at the Authority's discretion in respect to small companies, genuine newcomers to the industry, and in certain exceptional circumstances. The Ministers considered that a total provision of £2.0 million (\$5.6 million) for grants for trawlers should be adequate for the period up to the end of 1965. Loans--of up to 60 percent of a trawler's cost--should be made only to applicants who satisfied the Authority that they could not borrow on the open market at reasonable rates of interest.

The trend towards greater concentration of ownership of trawlers in England and Wales continued in 1961. Six companies, or groups of companies, now own 60 percent of the fleet. In Scotland also, the number of owners fell. At Aberdeen at the end of 1961, a total of 51 owners controlled 129 vessels, compared with 62 owning 122 vessels a year earlier.

Marketing and Distribution: The Authority's report records the steps taken on the Fleck Committee's recommendation "that a deliberate and concentrated attempt should be made to raise the average quality of fish by improved handling methods." The recommendation was endorsed in the Government's White Paper of August 1961. The terms of a resolution adopted by a conference convened by the Department of Scientific and Industrial Research at Hull in November showed that the need to raise standards was widely recognized in the industry. A series of discussions on the matter are being arranged jointly by the Fisheries Departments and the Authority. The first, which was held in April 1962, was with representatives of the trawler owners, distributors, and quick-freezers. Meetings with other interests concerned have been planned.

In the course of the year, the Authority discussed with representatives of distributors' organizations some proposals on fish boxes put forward originally by the National Federation of Fish Friers. There was general agreement that regulations should be made prohibiting, first, the use of any box for fish if it had previously been used for another commodity and, secondly, the use of returnable boxes for quantities of more than two stones (28 pounds) of fish. The matter, including the question of enforcement, is now being examined in detail.

The assembly of the equipment for the pilot project for mechanizing the unloading and handling of fish at Grimsby was completed in 1961. It was tried in sections at experimental landings. Progress was delayed for several weeks through the strike in the spring. The results are promising, but certain problems and modifications require further study. While the equipment on trial is providing useful experience, it is



Fig. 3 - At Grimsby, after unloading from the trawler in wicker baskets, fish is transferred to aluminum trays for display to buyers. Auction begins at 7:30 a.m.

cumbersome and difficult to maneuver and is not the ultimate answer. But the traditional method of unloading is clearly wasteful and gives no ground for complacency.

The committee for Scotland and Northern Ireland has continued consultations with the advisory panel on the Highlands and Islands on the development of the shelffish industry, particularly crab fishing.

The Authority's publicity appropriation for 1961/62 remained at the previous year's figure of £75,000 (\$210,000). While the broad divisions of expenditure were much the same--advertising in evening newspapers throughout the country, the merchandising service among fish-mongers and fish friers, and educational work--the general theme of the campaign was revised to take account of the findings of the consumer survey conducted in 1960.

According to returns submitted to the Authority, British production of frozen processed fishery products rose in 1961 by 7.1 percent to 56,157 tons, a smaller advance than in the previous year; about 30,000 tons were in bulk or institutional packs and 26,000 tons were in consumer packs. This production represented a usage of 16.3 percent of total white fish landings. Home market sales rose by 8.8 percent, again a smaller increase than in 1960.

The pilchard catch of 2,669 tons showed a further decline in 1961 of nearly 10 percent. Domestic production of canned pilchards fell by over 15 percent and imports from South and South-West Africa dropped by about 8½ percent.

British production of white fish meal fell slightly in 1961 to 71,100 tons, due to a further drop in supplies of raw materials. But imports showed an increase of 38 percent, mainly from Norway, Denmark, South Africa, Peru, and Iceland. Prices were on the average slightly lower.

Research: The Advisory Group on Experimental Fisheries Work, which was set up by the Fishery Ministers last year to consider what grant-aided experimental work should be done to help the fishing industry to adapt itself to the conditions it would have to face over the coming years, submitted their first report to the Ministers in the fall of 1961. The Authority has started working on the following recommendations of the Advisory Group.

1. Design of new vessels: It was recommended that the best method of assistance was for grants to be given

United Kingdom (Contd.):

en in suitable cases for building experimental vessels on condition that full information was made available for the industry. A grant for a Diesel-electric trawler designed to freeze her whole catch at sea has been made, and the Authority is keeping the need for other prototype freezer vessels under review.

2. Conversion of existing conventional trawlers: The Authority is commissioning a design study, as recommended by the Group, of the reengineering of a distant-water steam trawler, preferably with Diesel-electric machinery, and the installation of a freezing plant. Further studies of conversion to part-freezing of distant-water and middle-water motor trawlers will be considered.

3. Development of trawler-freezing plants: The Authority has approached a number of firms about the possibility of developing a compact and lighter compressor with other features advantageous to refrigerating work in trawlers.

Progress on research into trawling gear was made during the year. Modifications and improvements of the Granton trawl as used by distant-water vessels have been tested by the Fisheries Departments' research vessels Ernest Holt and Explorer, and other trials are planned. Complementary studies on fish behavior have been carried out in the Marine Laboratory at Aberdeen and Lowestoft, and there have been



Fig. 4 - Girls candling ocean perch fillets at a Grimsby frozen fish plant.

meetings between the Government scientists concerned with this work and the team working on the gear design.

The survey work by the near-water trawler Madeleine continued during the year, though it was severely restricted during the winter months by exceptionally rough weather. Among the different kinds of gear being tried is the latest type of French purse-seine net.

The Authority has asked the Department of Scientific and Industrial Research to inquire into the feasibility of icing and freezing pilchards for subsequent processing as well as the suitability for processing of pilchards caught during certain months of the year.

The Department of Agriculture and Fisheries for Scotland has given permission to a commercial processing concern to undertake exploratory trawling for shrimp in the upper reaches of the Firth of Forth and in the region of Largo Bay. Samples from the fishing are being examined by the Department's marine laboratory at Torry.

Approval was given in August 1961 to a request from the Aberdeen Fishing Vessel Owners' Association for financial assistance towards the cost of trials

with French gear by two Aberdeen trawlers. The trials established, briefly, that this gear was more effective in catching round fish than flat fish and produced higher catches of superior-quality haddock than the Aberdeen gear when fished during daylight. However, the apparent potential of the gear needs further confirmation. Approval has been given for an extension of the trials with the object of securing improvements and obtaining information on the gear's performance in deeper water than normally fished by Scottish trawlers.

The Authority's expenditure of £29,506 (\$82,617) on maintenance grants to fishermen and new entrants attending training was somewhat lower than the previous year's total of £31,184 (\$87,315) due to a decline in the number of trainees. On the other hand, Fleetwood began courses for new entrants which attracted a satisfactory enrollment. At Aberdeen, progress was made in the comprehensive course for Diesel engineers and in the prevocational courses.

The number of trainees receiving grants was 745 (460 on upgrading courses, 43 on Diesel engineers' courses, and 242 on new entrant courses).

Ten training courses were organized by the Authority for retail distributors, in cooperation with local trade associations and education authorities. Courses for fishmongers were arranged at Leeds, Manchester, Bristol, Birmingham, Dagenham, and Woolwich. Courses for fish friers were held at Leeds, Chester, Bristol, and Southampton. With the exception of the two courses in the London area, the numbers enrolling were good. More courses are being planned for the coming autumn and winter. (Fish Trades Gazette, July 7, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 96.

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BRITISH FISHERMEN NEED NEW FISHING GROUNDS:

Danish, Faroese, Norwegian, and Icelandic extensions of their national fishing limits or boundaries threaten to drive Britain's high-seas trawlers to such distant waters as the Antarctic or tropical areas of Southwest Africa, according to a news item in the London Financial Times of July 12, 1962.

In the future, British fishermen may have to cruise south of the Equator to sustain their present catch level. The trend towards extending national fishing limits to 12 miles could, within 10 years, deprive British trawlers of almost 9,000 square miles of fishing grounds now fished by them. The loss of such traditional fishing grounds may reduce the present British trawler catch by about 30 percent.

According to the London newspaper, the most promising undeveloped trawling grounds are located in waters off Southwest Africa and the Antarctic. Russian trawlers are now conducting exploratory fishing off Southwest Africa. So far British exploratory trawling

United Kingdom (Contd.):

has been limited to the Farm area west of Ireland, the Dohrn Bank off Greenland, and the Grand Banks off Newfoundland. (Berlingske Tidende, Copenhagen, July 13, 1962, as translated by the Fisheries Attaché, United States Embassy, Copenhagen.)

* * * * *

BRITISH SUGGEST USING HELICOPTER FOR OCEAN TRAWLING:

Four aircraft designers in Yorkshire, England, have drawn designs for adapting a helicopter to ocean trawling. The designs envision a craft with a dead weight of about 400 tons that could fly 9 feet above the water. It would travel at a speed of up to 100 miles per hour on the way to and from fishing grounds, and have a range of 3,500 miles. It would cost an estimated £1 million (US\$2.8 million) to build. The designers emphasize the advantages of fishing from the air. (The South African Shipping News and Fishing Industry Review, May 1962.)

* * * * *

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that, as a result of a change in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from June 16 will be as follows:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than five years, $5\frac{3}{8}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than five years, but not more than 10 years, $5\frac{7}{8}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 10 years, but not more than 15 years, $6\frac{3}{4}$ percent, decrease $\frac{1}{8}$ percent; on loans for more than 15 years, but not more than 20 years, $6\frac{7}{8}$ percent, no change.

Processing plants: on loans for not more than 15 years, $7\frac{1}{2}$ percent, no change; on loans for more than 15 years, but not more than 20 years, $7\frac{1}{2}$ percent, no change.

The rates on loans made before June 16 are unchanged.

The White Fish Authority announced during the week ending July 21 the following ad-

ditional changes in rates of interest on loans made as from July 14:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for more than 10 years, but not more than 15 years, $6\frac{3}{8}$ percent, decrease $\frac{3}{8}$ percent; on loans for more than 15 years, but not more than 20 years, $6\frac{5}{8}$ percent, decrease $\frac{1}{4}$ percent.

All other rates were unchanged. (Fish Trades Gazette, June 23 and July 21, 1962.)

Note: See Commercial Fisheries Review, June 1962 p. 64.

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NEW SUBSIDY RATES:

Five plans introducing new rates for subsidies and grants for vessels in the white fish and herring industries were laid before Parliament on July 4, 1962, by the British Minister of Agriculture and Fisheries and the Secretary of State for Scotland. The plans were developed under the Sea Fish Industry Act of 1962 which received the Royal assent on July 3, 1962.

White Fish Subsidy (United Kingdom) Scheme, 1962: Provides for both basic and special rates for vessels of 80 feet or more in length. Also provides for changes in the rates for vessels under 80 feet. The new rates, except where otherwise stated, apply for the 12 months ending July 31, 1963. Distant-water vessels and near-middle water vessels will receive subsidy payments for each day at sea. Inshore vessel subsidies will be based on landings.

The rates for distant- and near-middle water vessels are as follows:

Type of Vessel	Payment Per Day at Sea	
	£	US\$
<u>Basic rates for vessels 80 feet or more in length, other than coal-burners:</u>		
Vessels between 80 and 110 feet . . .	9.0	25.20
Vessels between 110 and 140 feet . . .	13.0	36.40
Vessels 140 feet and over	15.0	42.00
<u>Special rates for vessels 80 feet or more in length:</u>		
Coal-burners:		
Vessels between 80 and 140 feet	6.5	18.20
Vessels 140 feet and over	7.5	21.00
Oil-burners built before Aug. 1, 1952:		
Vessels between 80 and 120 feet	2.0	5.60
Vessels between 120 and 140 feet:		
(a) which spent at least 30 percent of their days at sea in 1960 or 1961 fishing grounds in the vicinity of the Faroes:		
Between Aug. 1, 1962 and Dec. 31, 1962	5.0	14.00

(Continued on next page)

United Kingdom (Contd.):

Type of Vessel (Contd.)	Payment Per Day at Sea	
	£	US\$
Between Jan. 1, 1963 and July 31, 1963	2.0	5.60
(b) Other vessels	2.0	5.60
<u>Oil-burners built after July 31, 1952, and motor vessels:</u>		
Vessels between 80 and 90 feet ordinarily fishing from Aberdeen, Lowestoft, or Fleetwood	1.0	2.80
Vessels between 90 and 100 feet ordinarily fishing from Aberdeen	2.0	5.60
Vessels between 100 and 110 feet ordinarily fishing from Aberdeen, Granton, North Shields, Hartlepool, Milford Haven, or Fleetwood	3.0	8.40
Vessels between 110 and 120 feet ordinarily fishing from Aberdeen, Granton, North Shields, Grimsby, or Lowestoft:		
(a) which spent at least 30 percent of their days at sea in 1960 or 1961 fishing grounds in the vicinity of the Faroes		
Between Aug. 1, 1962 and Dec. 31, 1962	4.0	11.20
Between Jan. 1, 1963 and July 31, 1963	2.0	5.60
(b) Other vessels	2.0	5.60
Vessels between 120 and 130 feet ordinarily fishing from Aberdeen, North Shields, Grimsby or Lowestoft		
Between Aug. 1, 1962 and Dec. 31, 1962	3.0	8.40
Vessels between 130 and 140 feet ordinarily fishing from Grimsby		
Between Aug. 1, 1962 and Dec. 31, 1962	3.0	8.40
Rates for vessels under 80 feet in length:		
Vessels between 60 feet registered and 70 feet over-all length 1/	6.0	16.80
Vessels over 70 feet over-all, but under 80 feet registered length 2/	7.5	21.00
1/Includes seine-net vessels of any length up to 70 feet over-all which normally make voyages of more than 7 days.		
2/Includes seine-net vessels which meet the length requirement and which normally make voyages of more than 7 days.		

The subsidy rates for other vessels under 60 feet are based on landings. The rates are: 1s. 3d. per stone (\$1.25 for 100 pounds) for whole gutted fish and certain ungutted fish; 10d. per stone (83 U. S. cents for 100 pounds) for sprats and white bait; and 1s. 1d. per stone (\$1.08 per 100 pounds) for other whole ungutted fish.

Herring Subsidy (United Kingdom) Scheme, 1962: Provides for some changes in subsidy rates on herring. The new rates apply for the 12 months ending August 31, 1963. The rates for vessels over 40 feet are as follows:

Type of Vessel	Payment Per Day at Sea	Percentage Change from Old Rate
Motor vessels between 40 and 60 feet	7.5	21.00
Motor vessels between 60 and 80 feet	8.0	22.40
Motor vessels over 80 feet and all steam vessels	14.0	39.20

The herring subsidy rate for vessels under 40 feet are based on landings and have been increased to 6d. per stone (50.0 U. S. cents for 100 pounds). This is an increase of 2½d. per stone (20.8 U. S. cents for 100 pounds) over the old rate.

White Fish and Herring Subsidies (Aggregate Amount of Grants) Order, 1962: Increases from £25.25 million (\$70.7 million) to £30.25 (\$84.7 million) the aggregate amount of grants available towards the cost of the white fish and herring subsidies.

The White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1962: Revokes the White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1955, and provides for the payment of grants of 30 percent of the cost, up to a maximum of £13,000 (\$36,400), for new vessels under 80 feet; 30 percent of the cost, up to a maximum of £2,500 (\$7,000), for new motors for such vessels; and 25 percent of the cost, up to a maximum of £50,000 (\$140,000) for new vessels of 80 feet or over.

Grants for new vessels may in certain circumstances be repayable during a period of ten years and grants for new motors during a period of five years. Unlike previous schemes this scheme imposes no restrictions on voyages to distant waters by grant-aided vessels and does not require the vessels or engines to be built in the United Kingdom.

The Herring Industry (Grants for Fishing Vessels and Engines) Scheme, 1962: Revokes the Herring Industry (Grants for Fishing Vessels and Engines) Scheme, 1955, and provides for grants for new herring vessels and motors similar to those provided for white fish vessels and motors under the White Fish Industry (Grants for Fishing Vessels and Engines) Scheme, 1962.

All of the Schemes, with the exception of the White Fish and Herring Subsidies (Aggregate Amount of Grants) Order, 1962, require the approval of both Houses of Parliament. The excepted Scheme only requires the approval of the House of Commons. (*Fish Trades Gazette*, July 7, 1962, and *The Fishing News*, July 13, 1962.)

Note: See *Commercial Fisheries Review*, February 1962 p. 96.



Viet-Nam

TWO NEW TRAWLERS ADDED TO FISHING FLEET:

Two new trawlers arrived in Saigon in the summer of 1962 to add to Viet-Nam's small fishing fleet. The two trawlers were built in Japan and imported under the commercial import program of the U. S. Agency for International Development (AID). The vessels were purchased when the limited world-wide procurement policy of AID did not apply. Each vessel has icing facilities and can carry 50 tons of fresh fish.

According to officials of the Directorate of Fisheries, only two of Viet-Nam's fleet of six trawlers were operating in the summer of 1962. Four vessels were undergoing repairs. Cambodia seized and held two additional Viet-Nam trawlers in 1961. Cambodia said the vessels were operating in their territorial waters. (United States Embassy, Saigon, August 2, 1962.)



Yugoslavia

CANNED FISH PACK UP IN 1961:

Yugoslavia's canned fish pack (all species) increased steadily each year from 7,530 metric tons in 1956 to 19,997 tons in 1961. The 1957 pack of canned fish increased 40 percent

from the previous year. In 1958, the pack was 14.2 percent higher, in 1959 the increase was 3.8 percent, and in 1960 it was 32.3 percent more than the previous year.



Women at a Yugoslav cannery preparing fish for cooking in wire baskets prior to canning operation.

The canned fish industry in Yugoslavia packs some amount of tuna. Some of the raw fish is Japanese frozen tuna. Although the 1961 canned fish pack increased 20.8 percent from the 16,545 tons packed in 1960, the amount of tuna canned that year may not have increased appreciably. Deliveries of Japanese frozen tuna to Yugoslavia were lower in 1961 because of Japan's commitments to other countries. (*Indeks*, May 1962.)



PRESERVATION OF SOME MARINE FORMS

Screw-top jars containing a formalin solution should be at hand when collecting. Also, jars should be labelled immediately after collecting. A 10% formalin solution (10 parts formalin + 90 parts water) will take care of most forms. Although for more fragile forms a 5% solution (5 parts formalin + 95 parts water) should be used. Borax should also be added. If the animal is to be dried, first preserve in 70% alcohol (70 parts alcohol - 30 parts water) with some small amount of conosive sublimate (mercuric chloride) which will permeate the animal and prevent insects from touching him.

Also, if the specimen has dried out and you wish to restore the original form, place it in a solution containing one gram of tri-sodium phosphate in one liter of water. If it had been preserved in alcohol, the original shape will be restored. After the original shape returns, transfer it to 70% alcohol. (*Sea Secrets*, The Marine Laboratory, University of Miami, Coral Gables, Fla.)

FEDERAL ACTIONS

Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

REVISION OF FISHERIES LOAN FUND PROCEDURES:

The proposed revision of Part 250--Fisheries Loan Fund Procedures, published in the May 11, 1962, Federal Register, was adopted with minor editorial changes, and was promulgated in the Federal Register of July 19, 1962. The revision was effective at the beginning of the 30th calendar day following the date of publication in the Federal Register. Interested parties were given 30 days in which to submit written comments, sug-

gestions, or objections to the proposed changes. Two suggestions were received, and were considered in connection with the proposed changes.

The purpose of the revision is to provide for procedural changes necessitated by transfer of certain acts formerly performed by the Small Business Administration to the Department of the Interior, to clarify the meaning of several sections, and to provide published standards that insurance underwriters furnishing insurance on property serving as collateral for a fisheries loan must meet.

The revised procedures as published in the July 19, 1962, Federal Register follow:

Title 50—WILDLIFE AND FISHERIES

**Chapter II—Bureau of Commercial
Fisheries, Fish and Wildlife Service,
Department of the Interior**

SUBCHAPTER F—AID TO FISHERIES

PART 250—FISHERIES LOAN FUND PROCEDURES

Revision of Procedures

On page 4517 of the FEDERAL REGISTER of May 11, 1962, there was published a notice and text of a proposed revision of Part 250. The purpose of the revision is to provide for procedural changes necessitated by transfer of certain acts formerly performed by the Small Business Administration to the Department of the Interior, to clarify the meaning of several sections, and to provide published standards that insurance underwriters furnishing insurance on property serving as collateral for a fisheries loan must meet. Due to the numerous changes being proposed, the procedures will be more readily understood if the entire part is revised.

Interested persons were given 30 days within which to submit written comments, suggestions, or objections with respect to the proposed revision. Two suggestions were received and have been considered in connection with the proposed revision. The proposed revision is hereby adopted with minor editorial changes and is set forth below. This revision shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Part 250 is revised to read as follows:

Sec.	
250.1	Definition of terms.
250.2	Purposes of loan fund.
250.3	Interpretation of loan authorization.
250.4	Qualified loan applicants.
250.5	Basic limitations.
250.6	Applications.
250.7	Processing of loan applications.
250.8	Approval of loans.
250.9	Interest.
250.10	Maturity.
250.11	Security.
250.12	Books, records, and reports.
250.13	Insurance required.
250.14	Penalties on default.

AUTHORITY: §§ 250.1 to 250.14 issued under sec. 4, 70 Stat. 1121; 16 U.S.C. 742c.

§ 250.1 Definition of terms.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *Secretary*. The Secretary of the Interior or his authorized representative.

(b) *Person*. Individual, association, partnership or corporation, any one or all as the context requires.

(c) *State*. Any State, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, and the District of Columbia.

§ 250.2 Purposes of loan fund.

The broad objective of the fisheries loan fund created by the Fish and Wildlife Act of 1956 is to provide financial assistance which will aid the commercial fishing industry to bring about a general upgrading of the condition of both fishing vessels and fishing gear thereby contributing to more efficient and profitable fishing operations.

(a) Under section 4 of the act, the Secretary is authorized, among other things:

(1) To make loans for financing and refinancing of operations, maintenance, replacement, repair and equipment of fishing gear and vessels, and for research into the basic problems of fisheries.

(2) Subject to the specific limitations in the section, to consent to the modification, with respect to the rate of interest, time of payment of any installment of principal, or security, of any loan contract to which he is a party.

(b) All financial assistance granted by the Secretary must be for one or more of the purposes set forth in paragraph (a) of this section.

§ 250.3 Interpretation of loan authorization.

The terms used in the act to describe the purposes for which loans may be granted are construed to be limited to the meanings ascribed in this section.

(a) *Operation of fishing gear and vessels*. The words "operation of fishing gear and vessels" mean and include all phases of activity directly associated with the catching of fish and shellfish for commercial purposes, except the construction of new vessels.

(b) *Maintenance of fishing gear and vessels*. The words "maintenance of fishing gear and vessels" mean the normal and routine upkeep of all parts of fishing gear and fishing vessels, including machinery and equipment.

(c) *Replacement of fishing gear and vessels*. The words "replacement of fishing gear and vessels" contemplate the purchase of fishing gear or equipment, parts, machinery, or other items incident to outfitting for fishing to replace lost, damaged, worn, obsolete, inefficient or discarded items of a similar nature, or the purchase or construction of a fishing vessel to operate the same type of fishing gear as a comparable

vessel which has been lost, destroyed or abandoned or has become obsolete or inefficient. Any vessel lost, destroyed or abandoned more than two years prior to the date of receipt of the application shall not be considered eligible for replacement. In order to be eligible for replacement an obsolete or inefficient vessel must be permanently removed from commercial fishing, and if sold, must be sold subject to an agreement that it will not reenter the commercial fishery.

(d) *Repair of fishing gear and vessels.* The words "repair of fishing gear and vessels" mean the restoration of any worn or damaged part of fishing gear or fishing vessels to an efficient operating condition.

(e) *Equipment of fishing gear and vessels.* The words "equipment of fishing gear and vessels" mean the parts, machinery, or other items incident to outfitting for fishing which are purchased for use in fishing operations.

(f) *Research into the basic problems of fisheries.* The words "research into the basic problems of fisheries" mean investigation or experimentation designed to lead to fundamental improvements in the capture or landing of fish conducted as an integral part of vessel or gear operations.

§ 250.4 Qualified loan applicants.

(a) Any person residing or conducting business in any State shall be deemed to be a qualified applicant for financial assistance if such person:

(1) Owns a commercial fishing vessel of United States registry (if registration is required) used, or to be used, directly in the conduct of fishing operations, irrespective of the type, size, power, or other characteristics of such vessel;

(2) Owns any type of commercial fishing gear used directly in the catching of fish or shellfish;

(3) Owns any property, equipment, or facilities useful in conducting research into the basic problems of fisheries or possesses scientific, technological or other skills useful in conducting such research;

(4) Is a fishery marketing cooperative engaged in marketing all catches of fish or shellfish by its members pursuant to contractual or other enforceable arrangements which empower the cooperative to exercise full control over the conditions of sale of all such catches and disburse the proceeds from all such sales.

(b) Applications for financial assistance cannot be considered if the loan is to be used for:

(i) Any phase of a shore operation.

(2) Refinancing existing loans that are not secured by the fishing vessel or gear, or debts which are not maritime liens within the meaning of subsection P of the Ship Mortgage Act of 1920, as amended (46 U.S.C. 971).

(3) Refinancing existing mortgages or secured loans on fishing vessels and gear, or debts secured by maritime liens, except in those instances where the Secretary deems such refinancing to be desirable in carrying out the purpose of the Act.

(4) (i) Effecting any change in ownership of a fishing vessel (except for replacement of a vessel or purchase of the interest of a deceased partner), (ii) replenishing working capital used for such purpose or (iii) liquidating a mortgage given for such purpose less than 2 years prior to the date of receipt of the application.

(5) Replacement of fishing gear or vessels where the applicant or applicants owned less than a 20-percent interest in

said fishing gear or vessel to be replaced or owned less than 20-percent interest in a corporation owning said fishing gear or vessel: *Provided*, That applications for a replacement loan by an eligible applicant cannot be considered unless and until the remaining owners or shareholders shall agree in writing that they will not apply for a replacement loan on the same fishing gear or vessel.

(6) Repair of fishing gear or vessels where such fishing gear or vessels are not offered as collateral for the loan by the applicant.

(7) Financing a new business venture in which the controlling interest is owned by a person or persons who are not currently engaged in commercial fishing.

§ 250.5 Basic limitations.

Applications for financial assistance may be considered only where there is evidence that the credit applied for is not otherwise available on reasonable terms (a) from applicant's bank of account, (b) from the disposal at fair price of assets not required by the applicant in the conduct of his business or not reasonably necessary to its potential growth, (c) through use of the personal credit and/or resources of the owner, partners, management, affiliates or principal stockholders of the applicant, or (d) from other known sources of credit. The financial assistance applied for shall be deemed to be otherwise available on reasonable terms unless it is satisfactorily demonstrated that proof of refusal of the desired credit has been obtained from the applicant's bank of account: *Provided*, That if the amount of the loan applied for is in excess of the legal lending limit of the applicant's bank or in excess of the amount that the bank normally lends to any one borrower, then proof of refusal should be obtained from a correspondent bank or from any other lending institution whose lending capacity is adequate to cover the loan applied for. Proof of refusal of the credit applied for must contain the date, amount, and terms requested. Bank refusals to advance credit will not be considered the full test of unavailability of credit and, where there is knowledge or reason to believe that credit is otherwise available on reasonable terms from sources other than such banks, the credit applied for cannot be granted notwithstanding the receipt of written refusals from such banks.

§ 250.6 Application.

Any person desiring financial assistance from the fisheries loan fund shall make application to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington 25, D.C., on a loan application form furnished by that Bureau except in the discretion of the Secretary, an application made other than by use of the prescribed form may be considered if the application contains information deemed to be sufficient. Such application shall indicate the purposes for which the loan is to be used, the period of the loan, and the security to be offered.

§ 250.7 Processing of loan applications.

If it is determined, on the basis of a preliminary review, that the application is complete and appears to be in conformity with established rules and procedures, a field examination shall be made. Following completion of the field investigation the application will be forwarded with an appropriate report to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington 25, D.C.

§ 250.8 Approval of loans.

The Secretary will evidence his approval of the loan by issuing a loan authorization covering the terms and conditions for making the loan. Documents executed in connection with a loan shall be in a form approved by the Secretary. Any modification of the terms of a loan following its execution must be agreed to in writing by the borrower and the Secretary.

§ 250.9 Interest.

The rate of interest on all loans which may be granted is fixed at 5 percent per annum.

§ 250.10 Maturity.

The period of maturity of any loan which may be granted shall be determined and fixed according to the circumstances but in no event shall the date of maturity so fixed exceed a period of 10 years.

§ 250.11 Security.

Loans shall be approved only upon the furnishing of such security or other reasonable assurance of repayment as the Secretary may require. The proposed collateral for a loan must be of such a nature that, when considered with the integrity and ability of the management, and the applicant's past and prospective earnings, repayment of the loan will be reasonably assured.

§ 250.12 Books, records, and reports.

The Secretary shall have the right to inspect such books and records of the applicant as the Secretary may deem necessary. Disbursements on a loan made under this part shall be made only upon the agreement of the loan applicant to maintain proper books of account and to submit such periodic reports as may be required by the Secretary during the period of the loan. During such period, the books and records of the loan applicant shall be made available at all reasonable times for inspection by the Secretary.

§ 250.13 Insurance required.

(a) If insurance of any type is required on property under the terms of a loan authorization or mortgage it must be in a form approved by the Secretary and obtained from an underwriter satisfactory to the Secretary and meeting at least one of the following requirements:

(1) An underwriter licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(2) A foreign insurance company or club operating in the United States that has deposited funds in an amount and manner satisfactory to the Secretary in a bank chartered under the laws of a State or the United States of America, or in a trust fund satisfactory to the Secretary, which funds are solely for the payment of insurance claims of United States vessels.

(3) A reciprocal or interinsurance exchange licensed by an insurance regulatory agency of a State to write the particular form of insurance being written.

(4) An insurance pool composed entirely of owners and operators of fishing vessels.

(b) Any underwriter (including a company, club, or pool) writing such insurance shall furnish such reasonable financial or operating data as the Secretary may require to determine the standing and responsibility of said underwriter.

§ 250.14 Penalties on default.

Unless otherwise provided in the loan documents, failure on the part of a borrower to conform to the terms of the loan documents will be deemed grounds upon which the Secretary may cause any one or all of the following steps to be taken:

- (a) Discontinue any further disbursements of funds contemplated by the loan documents.
- (b) Take possession of any or all collateral given as security and the property purchased with borrowed funds.
- (c) Prosecute legal action against the borrower.
- (d) Declare the entire amount of the loan immediately due and payable.
- (e) Prevent further disbursement of any funds remaining under his control.

STEWART L. UDALL,
Secretary of the Interior.

JULY 12, 1962.



Eighty-Seventh Congress

(Second Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: Introduced in the Senate, S. 3606 (Humphrey) on Aug. 3, and S. 3658 (Case) on Aug. 21, 1962, to amend certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; referred to the Committee on Finance. Similar to other bills previously introduced.

FISH PROTEIN CONCENTRATE: The Subcommittee on Health and Safety of the House Committee on Interstate Commerce, held public hearings on Aug. 8 and 9, 1962, on H.R. 9101, 9102, and 9331 (identical bills), to amend clause (3) of section 402(a) of the Federal Food, Drug, and Cosmetic Act. Amends act so that "no processed seafood product shall be deemed to consist of any such substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof." Namely, it provides that a processed seafood product can be produced from whole fish and not be considered adulterated.

FOOD AND AGRICULTURE ACT OF 1962: The Senate on Aug. 21, 1962, resumed consideration of H.R. 12391, Food and Agriculture Act of 1962, to improve and protect farm income, to reduce costs of farm pro-

grams to the Federal Government's excessive stocks of agricultural commodities, to maintain reasonable and stable prices of agricultural commodities and products to consumers, to provide adequate supplies of agricultural commodities for domestic and foreign needs, to conserve natural resources, and for other purposes; in lieu of S. 3225, the Senate version of the same bill, Senator Ellender introduced an amendment on behalf of Senator Fulbright (Ark.) to H.R. 12391, which amendment had been unanimously agreed to by the Senate when it was considering S. 3225. The amendment reads "Sec. 343. As used in this title (1) the term 'farmers' shall be deemed to include persons who are engaged in, or who, with assistance afforded under this title, intend to engage in, fish farming, and (2) the term 'farming' shall be deemed to include fish farming." This is an amendment to a Committee amendment. The Senate agreed to the amendment of the Senator from Ark. A motion to reconsider the amendment was tabled.

The Senate on Aug. 22, 1962, passed with Committee amendment (in nature of a substitute) H.R. 12391. Senate insisted on its amendment, asked for conference with House, and appointed conferees.

GLOUCESTER HARBOR (MASS.) IMPROVEMENT: S. Rept. 1771, Authorizing Modification of the Project for Gloucester Harbor, Mass. (Report from the Committee on Public Works, United States Senate, 87th Congress, 2nd Session, July 23, 1962, to accompany S. 3544, 7 pp., printed. The Committee reported favorably thereon and recommended passage of the bill. Contains purpose of the bill, description of project, Committee views, and agency comments.

The Senate on Aug. 2, 1962, passed S. 3544, to authorize modification of the project for Gloucester Harbor, Mass. This bill authorizes the deepening of Gloucester Harbor to 20 feet and provides turning and anchorage basins.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS FY 1963: S. Rept. 1872, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1963 (June 29, 1962, a report from the Committee on Appropriations, to accompany H.R. 10904, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies for the fiscal year ending June 30, 1963, and for other purposes). Included is \$959,000 to equip and properly staff the two shellfish laboratories on the East and Gulf Coasts of the United States; also funds for research grants for shellfish technology and marine ecology, shellfish sanitation, water pollution control, and vocational training (including fisheries).

The Senate on July 20, 1962, passed H.R. 10904 amended. Senate insisted on its amendments, asked for conference with the House and appointed conferees. Conference was held July 25, 1962, and the report filed July 31, 1962 (H. Rept. 2100).

H. Rept. 2100, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1963 (July 31, 1962, a report from the Committee on Conference to accompany H.R. 10904). The Committee on Conference came to agreement and presented their recommendations to their respective Houses.

The House on Aug. 1, 1962, adopted the conference report and the Senate on Aug. 2, 1962, also agreed to conference report, thus clearing the bill for the President's signature.

The President on Aug. 14, 1962, signed H.R. 10904, fiscal 1963 appropriations for the Departments of Labor and Health, Education and Welfare (P.L. 87-582).

EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS: The House Committee on Interstate and Foreign Commerce met Aug. 7 through 10, 1962, on H.R. 11583, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. The Committee on Aug. 10, concluded hearings on H.R. 11583. Testimony was given by personnel of various agencies and industry. Hearings adjourned subject to the call of the Chair.

The Senate Committee on Commerce, July 27, 1962, concluded hearings on S. 3243, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. Testimony was heard from various Federal agencies and Congressmen. The hearings were recessed subject to call. The Senate Committee on Aug. 22 and 23, 1962, resumed hearings on S. 3243.

INCOME TAX REVISION IN FAVOR OF FISHERMEN: The Senate Committee on Finance, in executive session, Aug. 3, 1962, ordered favorably reported H.R. 6413, to extend to fishermen the same treatment accorded farmers in relation to estimated income tax. The Senate, the same date, received the report (S. Rept. No. 1819) from the Committee.

S. Rept. 1819, Declaration of Estimated Income Tax by Fishermen (Report from the Committee on Finance, United States Senate, 87th Congress, 2nd Session, Aug. 3, 1962, to accompany H.R. 6413), 7 pp., printed. The Committee reported favorably with amendments and recommended passage of the bill. Contains a summary of House provision, summary of Committee amendment, a general explanation of the House provision and Committee amendment, and changes in existing laws. The House bill provides that, for purposes of the estimated income tax, fishermen are to be accorded the same treatment as is presently available for farmers. The Committee amendment makes the extra 10-percent limitation on deduction of charitable contributions (presently available in the case of contributions to a church, school, hospital, or medical research organization) available also in the case of contributions to an organization which normally receives a substantial part of its support from the United States or any State or political subdivision thereof or from direct or indirect contributions from the general public, organized and operated exclusively to receive, hold, invest, and administer property and to make expenditures to or for the benefit of a State university or college, including a land-grant college or university. This provision is to apply to taxable years beginning after Dec. 31, 1960.

The Senate on Aug. 8, 1962, passed over H.R. 6413.

INDIAN FISHING RIGHTS: H.J. Res. 838 (Tollefson) introduced in the House on July 25, 1962, regarding Indian fishing rights; referred to the Committee on Interior and Insular Affairs. Similar to other bills previously introduced. Proposes to solve the problem of treaty and non-treaty Indians fishing off the reservation in violation of State regulations.

INTERIOR APPROPRIATIONS FY 1963: The House on July 26, 1962, agreed to a conference with the Senate on H.R. 10802, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1963, and for other purposes. The House appointed the following conferees: Messrs. Kirwan, Magnuson, Cannon, Jensen, and Taber. The conferees met on July 27, 1962.

The Senate and the House held a joint conference, in executive session, July 27, 1962, on H.R. 10802.

H. Rept. 2049, Department of the Interior and Related Agencies Appropriation Bill, 1962 (July 27, 1962), a report from the Committee of Conference on H.R. 10802, 11 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included are funds for the Bureau of Commercial Fisheries, the Bureau of Sport Fisheries and Wildlife, and the Commissioner's Office. The conferees agreed to appropriate to the Bureau of Commercial Fisheries the following appropriations of \$15,225,000 for management and investigation of resources instead of \$14,600,000 as proposed by the House and \$15,981,000 as proposed by the Senate. The increase over the House allowance provides for \$325,000 for expanded biological research on shrimp in the Gulf of Mexico; \$100,000 for research and development of shrimp gear; and \$200,000 for Atlantic herring research; and appropriations of \$8,473,000 for construction as proposed by the Senate instead of \$7,900,000 as proposed by the House. The increase provides for \$413,000 for equipment for the laboratories at Seattle, Wash., and Ann Arbor, Mich., and \$160,000 for purchase of land and land filling to initiate construction of the Shellfish Research Center at Milford, Conn. Granted to the Bureau of Sport Fisheries and Wildlife was \$27,112,000 for management and investigation of resources, which included \$100,000 for technical assistance in sport fishing management through cooperative programs with Indian tribes; \$150,000 for establishing new cooperative fishery units at five institutions; \$105,000 for increased fish control research in the southeastern United States; \$85,000 for increased reservoir research in the White River interstate reservoir complex of Arkansas and Missouri; and \$25,000 for continuing a fishery management project at Springville, Utah. Construction funds included \$125,000 for improvements at the Federal Fish Farm Experiment Station, Kelso, Arkansas; \$340,000 for the establishment of a fish genetics facility in Wyoming; and 11 fish hatcheries. Appropriation for the Office of the Commissioner was \$364,000.

The House on July 30, 1962, received the conference report (H. Rept. No. 2049) on H.R. 10802. The House in a voice vote adopted the conference report and sent the legislation to the Senate.

The Senate on Aug. 1, 1962, adopted the conference report (H. Rept. No. 2049) on H.R. 10802, thereby clearing the bill for the President's signature.

The President, on Aug. 9, 1962, signed H.R. 10802 (P.L. 87-578).

INTERNATIONAL FISHERIES ORGANIZATIONS: United States Contributions to International Organizations (Letter from the Acting Secretary of State Transmitting the 10th Report on the Extent and Disposition of U.S. Contributions to International Organizations for

the Fiscal Year 1961. Pursuant to Section 2 of Public Law 806, 81st Congress, H. Doc. 460, 146 pp., printed. It is the annual report presented to Congress on the United States contributions to International Organizations by the Secretary of State. Included are reports on the following international fisheries organizations: Inter-American Tropical Tuna Commission; International Commission for the Northwest Atlantic Fisheries; International North Pacific Fisheries Commission; International Whaling Commission; and North Pacific Fur Seal Commission. It also contains a chart showing the estimated contributions from 1946 to 1962.

MEDICAL CARE FOR VESSEL PERSONNEL: The Subcommittee on Health and Safety of the House Committee on Interstate Commerce announced that public hearings were held on Aug. 13, 1962, on H.R. 3797, 8029, 10921, and 11920, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel. Owner-fishermen and all persons employed as fishermen on board United States registered, enrolled, and licensed commercial fishing vessels could be considered for eligibility for the medical and dental services that are provided for seamen.

NATIONAL FISHERIES CENTER AND AQUARIUM: S. Report No. 1782, Authorizing the Administrator of General Services to Construct a National Fisheries Center and Aquarium in the District of Columbia (July 23, 1962, Report of the Committee on Public Works, United States Senate, 87th Congress, 2nd Session, to accompany H.R. 8181, to authorize the construction of a National Fisheries Center and Aquarium in the District of Columbia and to provide for its operation), 15 pp., printed. Committee reported bill favorably, with amendments, and recommended passage. Contains purpose of the bill, hearings, amendments, general statement, committee views, estimated Federal cost, and agency comments. The purpose of the bill as amended is to authorize the Administrator of General Services to plan, construct, and maintain a National Fisheries Center and Aquarium in the District of Columbia or its vicinity, for the display of freshwater, marine, and shell fish and other aquatic resources for educational, recreational, cultural, and scientific purposes. The facility would be operated by the Secretary of the Interior, who would assign such responsibility to that branch of the Bureau of Sport Fisheries and Wildlife having as its major activity the rearing and holding of living fish, including the operation of aquariums. A non-partisan advisory board would be established to render advice and to submit recommendations to the Secretary concerning the management and operation of the Center and Aquarium. The cost would not exceed \$10 million, and the Secretary will establish charges for visits to the Center and Aquarium, and for other uses, at such rates that will produce sufficient revenues to cover an appropriate share of its annual operation and maintenance costs.

NATIONAL FISHERIES PROBLEMS: In the Senate on Aug. 3, 1962, Senators Magnuson, Bartlett, and Smith (Mass.) discussed at length (Congressional Record, Aug. 3, 1962, pp. 14565-14571) national fisheries problems. Attention was called to the decline of our United States fisheries while foreign nations have taken action to expand and modernize their own fishing fleets. Sen. Magnuson stated: "Our own fishing fleets composed of small and ancient ships equipped with long outdated gear are disintegrating." It was further brought out that a few years ago the United States

commercial fishery catch was exceeded only by Japan. Today we are topped also by Soviet Russia, Communist China, and Peru. Also incorporated in the Record is the speech given by the Assistant Secretary of the Interior for Fish and Wildlife, Frank P. Briggs, "Fisherries in a Changing World," at the Annual Convention of the Oyster Institute of North America in Baltimore, Md., on July 31, 1962. Sen. Bartlett, in introducing an amendment (Congressional Record, Aug. 3, 1962, pp. 14563-65) to the Trade Expansion Act of 1962 (H.R. 11970), which would protect the United States fisheries, also discussed national fisheries problems and the fishing of foreign nations off our coasts.

OCEANOGRAPHIC RESEARCH: The Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries met Aug. 9, 1962, on H.R. 12601, to provide for a comprehensive, long-range, and coordinated national program in oceanography and for other purposes. The Subcommittee ordered reported favorably to the full committee H.R. 12601, amended.

The House Committee on Merchant Marine and Fisheries, Aug. 14, 1962, met in executive session and ordered reported favorably to the House H.R. 12601 amended. The House on the same date received the report (H. Rept. 2221) from the Committee; referred to the Committee of the Whole House on the State of the Union.

H.R. 12601 was passed by the House on Aug. 20. The language of H.R. 12601 then was substituted for S. 901, a similar bill passed by the Senate on July 28, 1961. Then S. 901 was passed by the House on Aug. 20, 1962. It was sent to the Senate for concurrence as amended. Senate received S. 901 (amended) as passed by the House on Aug. 21, 1962.

OYSTER BROOD STOCK PURCHASES: The House on July 30, 1962, concurred with the Senate amendments to H.R. 7336, to promote the production of oysters by propagation of disease-resistant strains, and for other purposes.

On Aug. 9, 1962, the President signed H.R. 7336 (P.L. 87-580). The Secretary of the Interior is authorized to acquire oyster brood disease-resistant stock for transfer to the particular States involved for planting in spawning sanctuaries. Distribution of the resultant seed oysters by the States shall be in accordance with the plans and procedures that are mutually acceptable to the Secretary and the cooperating States. The purchase of the stock by the Secretary shall be conditional upon the participating State or States, in each instance, paying one-third of the cost of such stock. The Secretary is authorized to make grants to the States for the purpose of assisting such States in the financing of research and other activities necessary in the development and propagation of disease-resistant strains of oysters. A grant shall be made upon agreement by the State to use the proceeds thereof only for the purposes specified and to use an additional amount for such purposes from State or other non-Federal sources equal to at least 50 percent of the amount of such grant. Federal Government total appropriation for such grants is \$100,000.

POTOMAC RIVER COMPACT (MD. & VA.) OF 1958: H. Rept. 1980, Potomac River Compact (July 17, 1962), report from the Committee on the Judiciary, to accompany H.J. Res. 659, 4 pp., printed. The Committee reported favorably thereon without amendment and recommended that the resolution be passed. Contains the purpose, statements, and agency reports.

The House on Aug. 6, 1962, passed H. J. Res. 659, granting consent of the Congress to a compact entered into between the State of Maryland and the Commonwealth of Virginia for the creation of the Potomac River Compact of 1958. Gives Maryland and Virginia permission to set up a Potomac River Fisheries Commission. It would regulate through three members from each State the taking of fish and shellfish from the Potomac River between the District of Columbia line and Chesapeake Bay. Research, regulation of fisheries, an oyster inspection fee and licensing would be within the power of the new commission. The compact succeeds an obsolete agreement of 1785, which has been disputed by the States. The bill was sent to the Senate.

PRICE-QUALITY STABILIZATION: H. J. Res. 832 (Mason) and H. J. Res. 833 (Nelson) introduced in the House on July 25, 1962, to amend the Federal Trade Commission Act, to promote quality and price stabilization to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to the Committee on Interstate and Foreign Commerce.

The Special Fair Trade Subcommittee of the Senate Committee on Commerce, on July 25, 1962, met in executive session and approved for full committee consideration with amendments S.J. Res. 159, to promote quality and price stabilization.

The Subcommittee on Commerce and Finance of the House Committee on Interstate and Foreign Commerce, Aug. 2, 1962, ordered reported favorably to the full committee, H.J. Res. 636.

H.J. Res. 857 (MacGregor) introduced in the House on Aug. 16, 1962; referred to the Committee on Interstate and Foreign Commerce. Similar to other bills previously introduced.

SCIENCE AND TECHNOLOGY COMMISSION: Create a Commission on Science and Technology (Hearings before the Committee on Government Operations, United States Senate, 87th Congress, 2nd Session, on S. 2771 to provide for the establishment of a Commission on Science and Technology, Part 2, July 24, 1962), 74 pp., printed. Contains information on the hearing, and statements and communications from various Federal agencies and industry personnel.

The Senate Committee on Government Operations, Aug. 2, 1962, ordered favorably reported with amendments S. 2771 for the establishment of a Commission on Science and Technology. The Senate on Aug. 6, 1962, received the report (S. Rept. No. 1828) on S. 2771. The bill provides for the establishment of a Hoover-type commission composed of representatives from a legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. The objectives of the proposed Commission provide for a study of all of the programs, methods, and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with the purpose of bringing about more economy and efficiency in the performance of these essential activities and

functions. Emphasis has also been directed toward the need for developing a program for the elimination of duplication in science efforts, where one agency of Government works on programs which are under way in other agencies, or where research is being done on problems which have already been solved by other scientists. The Commission also would be specifically directed to study and recommend ways and means of meeting our scientific manpower needs. In undertaking its studies the Commission would be vested with authority to set up a Science Advisory Panel of outstanding science, engineering and technological authorities from all sections of the Nation to assist it in the performance of the functions outlined in the bill.

S. Rept. 1828, Establishment of a Commission on Science and Technology (Aug. 6, 1962, Report of the Committee on Government Operations, United States Senate, 87th Congress, 2nd Session, on S. 2771), 54 pp., printed. The Committee reported favorably with amendments and recommended passage of the bill. Contains an analysis of provisions of the bill, Committee amendments, background, and abstracts from hearings on the bill. The Committee amendments, which are of a technical and perfecting nature, were adopted with a view to further clarify the purpose and objectives of the proposed legislation.

The Senate on Aug. 8, 1962, passed with amendments S. 2771. The bill was sent to the House.

The House, Aug. 9, 1962, received from the Senate S. 2771; referred to the Committee on Science and Astronautics.

SPORT FISH RESEARCH: S. 1542 (McGee) introduced in the Senate on Apr. 12, 1961, to authorize the Secretary of the Interior to conduct studies of the genetics of sport fish and to carry out selective breeding to develop strains with inherent attributes valuable in programs of research, fish hatchery production, and management of recreational fishery resources. Would authorize the Secretary of the Interior to establish fishery research laboratories. The Senate Committee on Commerce, on Aug. 7, 1962, reported favorably (S. Rept. No. 1857) on S. 1542 with amendments.

S. Rept. 1857, Studies of Genetics of Sport Fishes (Report from the Committee on Commerce, United States Senate, 87th Congress, 2nd Session, August 7, 1962, to accompany S. 1542), 5 pp., printed. The Committee reported favorably with amendments and recommended that the bill be passed. Contains purpose of the bill, costs, and agency reports.

The Senate on Aug. 9, 1962, passed with amendments S. 1542. Cleared for the House.

The House on Aug. 13, 1962, received from the Senate S. 1542; referred to the Committee on Merchant Marine and Fisheries.

STERN RAMP TRAWLERS: S. 3610 (Magnuson and others) introduced in the Senate on Aug. 3, 1962, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and for other purposes; referred to the Committee on Commerce. The trawlers (one for the West Coast and one for the East Coast) would have scientific facilities suitable for use as research vessels and for the development of advanced technology for the production, preparation, processing, and preservation of fishery products, including those from areas distant from

ports and subject to severe climatic difficulties. The vessels would be prototype vessels for United States fisheries fleets of the future. It requires that any disposal of fishery products caught and processed must be done with due regard to the possible impact on the domestic fisheries industry and in a manner to avoid adverse effects upon domestic prices or current market demands. The bill would help our own fisheries industry compete against the massive foreign fishing fleets now operating off our shores. The Interior Secretary would have the option of chartering these vessels or operating them himself, but charters would be subject to certain conditions and stipulations. Companion bills H.R. 12848 (Bates) and H.R. 12928 (MacDonald) were introduced in the House on Aug. 9 and 16, 1962, respectively, also H.R. 12959 (Glenn) on Aug. 23; all referred to the Committee on Merchant Marine and Fisheries.

SUPPLEMENTAL APPROPRIATIONS FY 1963: The House on Aug. 13, 1962, received a communication from the President (H. Doc. No. 514) transmitting proposed supplemental appropriations for the fiscal year 1963 for the Judiciary, the District of Columbia, and various agencies of the Executive Branch. Includes funds for the Bureau of Commercial Fisheries in the amount of \$500,000 for research and development of processes to produce a concentrated protein from fish. This program is based on the results of a survey of scientific and development work on this subject under way in other countries which were not available when the 1963 budget was presented. Because of the growing need for a low-cost, dietary supplement of animal protein in many countries, the potential benefits to the fishing industry, and for the improved conservation of fishery resources, a research and development program should be started at this time.

H. Doc. 514, Supplemental Appropriations for the Judiciary, the District of Columbia, and Various Agencies of the Executive Branch (Communication from the President of the United States transmitting proposed supplemental appropriations for the fiscal year 1963 in the amounts of \$20,000 for the Judiciary and \$10,886 for the District of Columbia, proposed supplemental appropriations for the fiscal years 1962 and 1963 in the amount of \$595,826,000, and requests for consideration of four items transmitted in the 1963 budget for various agencies of the Executive Branch), 87th Congress, 2nd Session, House of Representatives, 19 pp., printed. Included are funds for the Bureau of Commercial Fisheries in the amount of \$500,000 for research and development of processes to produce a concentrated protein from fish.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: The House Subcommittee on Public Lands of the Committee on Interior and Insular Affairs met in executive session on July 27, 1962, and ordered reported favorably to the full committee H.R. 8362, amended, to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected is the site of the Bureau of Commercial Fisheries Technological Laboratory at College Park, Md.

TRADE EXPANSION ACT OF 1962: Senator Bartlett, Aug. 3, 1962, introduced an amendment to the Trade Expansion Act of 1962, H.R. 11970, to promote the general welfare, foreign policy, and security of the United States through international trade agreements and through adjustment assistance to domestic

industry, agriculture, and labor, and for other purposes. The amendment is offered to section 252(b) of chapter 6, title II, that portion of the trade bill which specifies the conditions under which the President can withhold or withdraw from a particular country the benefits of trade concessions given to all countries. The amendment offers two additional circumstances under which the President may take this action, and it supplements the authority given him under the present bill by adding the power to impose import quotas and embargoes, all intended to guarantee the preservation of our fishery resources.

In its present form, section 252(b) permits the President to suspend or withdraw any trade concession to a nation which engages in an action that burdens or restricts United States commerce. With the addition of this amendment, the President can take the same action when another country permits its citizens to engage in fishing activities which will defeat the effort of our States and our Federal Government to conserve our fishery resources or when a foreign government allows its nationals to harass or interfere with our fishermen on the high seas while they are engaged in lawful activities. With this amendment, the President can not only maintain present tariffs with regard to a specific country, which is engaging in practices which do violence to our conservation efforts, but if appropriate, he can also increase our present tariff, for example, on canned salmon and crab from 15-1/2 percent ad valorem to 25 percent. This can be done without changing tariffs on fresh or frozen salmon and crab which may be considered an important source of supply. This amendment also gives the President flexible powers to adjust imports by another action including the use of import quotas or embargoes.

Paragraph (c) of section 252 states that the President shall provide an opportunity for a hearing and public presentation of views on these problems. In the event a foreign country is violating principles of fishery and resources conservation, this provision, with the amendment, amply insures that any person shall have adequate opportunity to protest.

Senator Javitts, Aug. 7, 1962, submitted to the Senate 8 amendments to H.R. 11970. They were printed in the Congressional Record, Aug. 7, 1962, pp. 14705-14706. Proposed amendment A would authorize the President to eliminate tariffs on a mutual basis with all fully developed countries or areas of the free world, provided that the most substantial concessions are made on the products of the strongest United States industries. Amendment B provides for the use of authority for the purpose of getting the fully developed nations to share the burden of providing markets for the developing nations—a burden which the United States has been carrying to a large extent alone. Proposed amendment C is designed to facilitate the escalation of international labor standards and to place greater pressure on exporting nations to refrain from subsidizing their exports through artificially depressed wages. Amendment D would specify infringements of United States patents, copyrights, and registered trademarks as actions unjustifiably restricting United States commerce and as cause for retaliatory action by the United States. Amendment E would provide for a termination date (June 30, 1974) for the certification of firms and workers eligible for adjustment assistance; would provide for such termination through concurrent resolution of the Congress. Amendment F would require the President to submit a detailed report on ex-

poses, chapter 6, or the trade act of 1950, authorizes the Secretary of Commerce to a reorganization of the Bureau of Economic Analysis to a maximum of 1,000 personnel, and also to consider the impact of proposed legislation on the economy. The House Committee on Interstate and Foreign Commerce concluded hearings on H.R. 11970, Testimony was received from Congressmen, various Federal agencies, and industry personnel.

Sen. Pell on Aug. 15, 1962, introduced several amendments to H.R. 11970. One amendment directs the Secretary of Labor to compile a comparative real wage index which would contrast the average real wages or earnings--in terms of purchasing power--for a worker in an American industry with the average real wages or earnings for a worker in the same industry in a country with which we would be negotiating an agreement. The second amendment would make grants, in addition to loans, available to firms for the purpose of acquiring and installing new machinery, or modernizing or converting existing machinery. An additional amendment concerns a community which has a firm or firms with deep roots in the economical life of that community. This amendment would authorize such a community, which suffers serious injury through idling of productive facilities and unemployment resulting from expanded imports, to apply for adjustment assistance. This would include technical assistance and appropriate financial assistance for public facilities which would materially contribute to the economic adjustment of the particular community.

TRANSPORTATION ACT OF 1962: The House Committee on Interstate and Foreign Commerce met Aug. 7 through 10, 1962, on H.R. 11584, to provide for strengthening and improving the national transportation system, and for other purposes.

The House Committee on Aug. 10, 1962, concluded hearings on H.R. 11584. Testimony was given by personnel of various agencies and industry. Hearings adjourned subject to the call of the Chair.

The Senate Committee on Commerce, July 27, 1962, concluded hearings on S. 3242, to provide for strengthening and improving the national transportation system, and for other purposes. Testimony has been heard from various Federal agencies, congressmen. The hearings were recessed subject to call.

The Senate Committee on Aug. 22 and 23, 1962, resumed hearings on S. 3242, to provide for strengthening and improving the national transportation system, and for other purposes.

TUNA CONVENTION ACT OF 1950: Conservation of Tropical Tuna (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, 87th Congress, 2nd Session, on S. 2568, a bill to amend the act of September 7, 1950, to extend the regulatory authority of the Federal and state agencies concerned under the terms of the convention for the establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, and for other purposes.), 128 pp., printed. Contains hearings held May 23, 24, 1962, on S. 2568; testimonies, letters, and reports from various Federal agencies and industry representatives are included.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: S. 3611 (Magnuson and others) introduced in the Senate, Aug. 3, 1962, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Commerce. Would extend the provisions of the existing fishing vessel construction differential subsidy law (40 U.S.C. 1401-1413) to fisheries which are unable to obtain a finding of injury caused by increased imports; also would increase the limitation on the subsidy paid from 33-1/3 percent on all vessels to 35 percent on wood vessels and 50 percent on metal vessels. Would increase the annual authorization from \$2.5 million to \$12.5 million and extend the date for the last application for subsidy from June 12, 1963, to July 30, 1972. The following identical House bills were introduced: H.R. 12849 (Bates) Aug. 9; H.R. 12927 (MacDonald) Aug. 16; H.R. 12960 (Glenn) Aug. 23; and H.R. 12967 (Tollefson) Aug. 23; all referred to the Committee on Merchant and Fisheries.

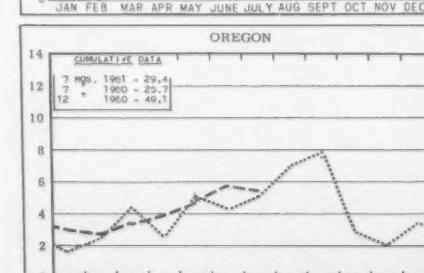
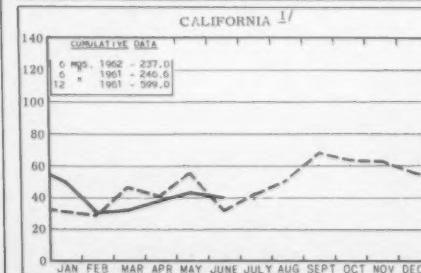
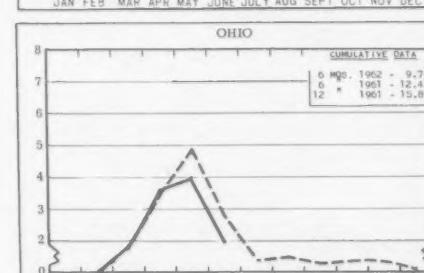
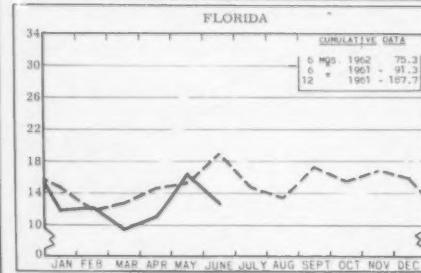
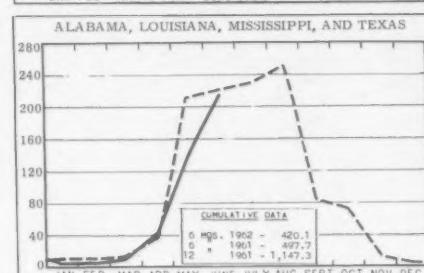
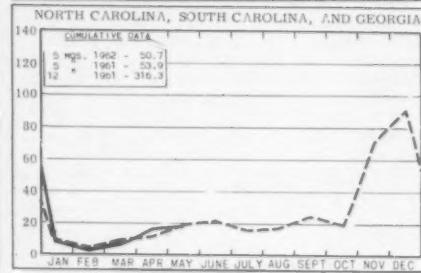
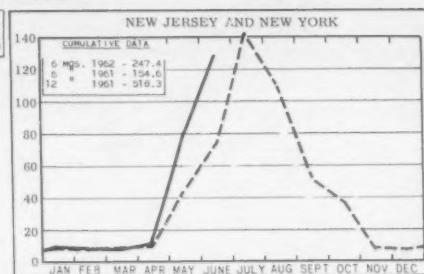
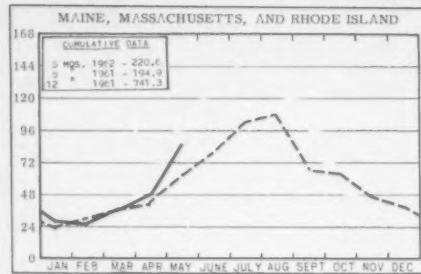
VESSEL TRANSFER: The House on July 30, 1962, concurred with the Senate amendments to H.R. 3788, to provide for the transfer of the United States vessel Alaska to the Department of Fish and Game of the State of California. The amended bill makes the transfer conditional upon the State of California paying the Federal Government an amount equal to 50 percent of the fair market value of the vessel at the time it was leased by the State of California; it also provides that if the vessel should cease to be used for a public purpose, all right, title, and interest therein shall revert to the United States. The bill was cleared for the President's signature.

The President on Aug. 9, 1962, signed H.R. 3788, (P. L. 87-576).



FISHERY INDICATORS

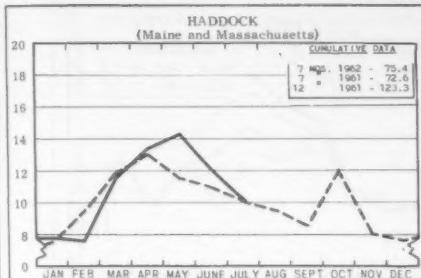
CHART I - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds



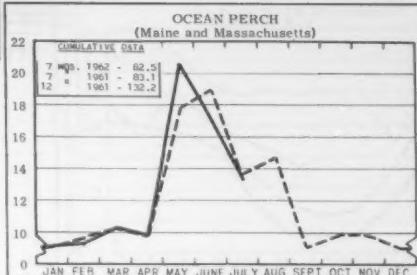
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

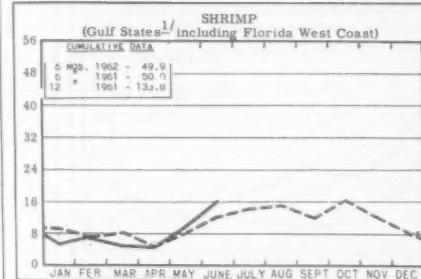
In Millions of Pounds



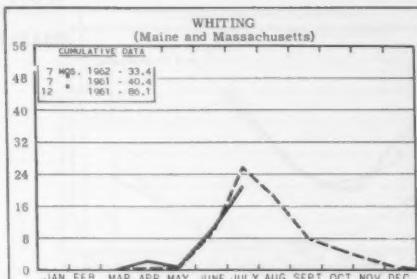
LEGEND:
— 1962
- - - 1961



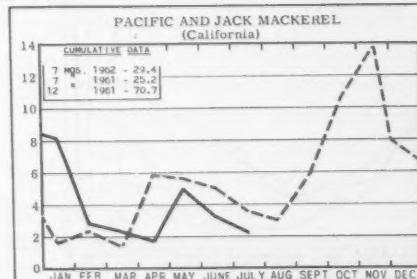
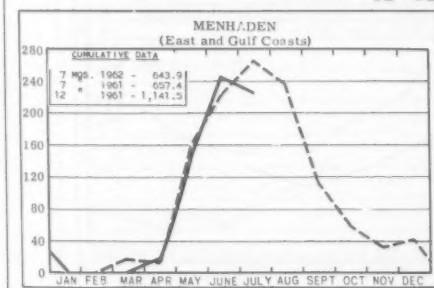
In Millions of Pounds



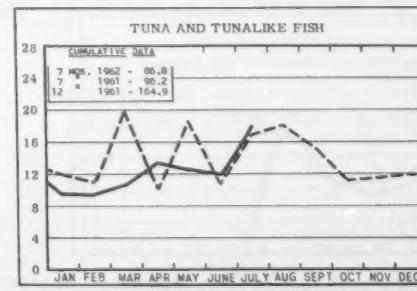
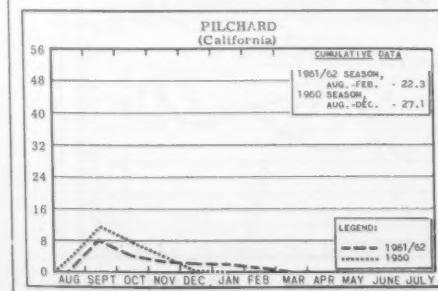
^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



In Thousands of Tons

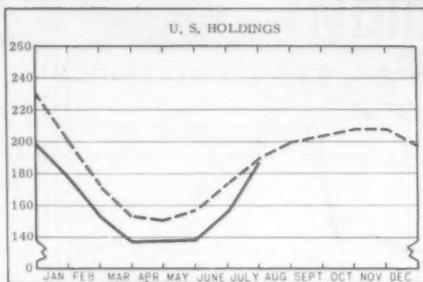


In Thousands of Tons

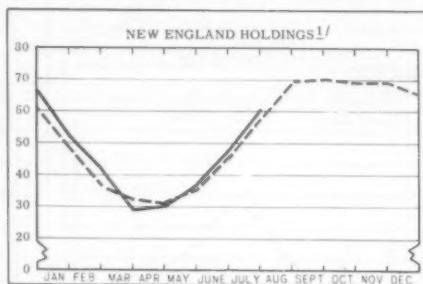
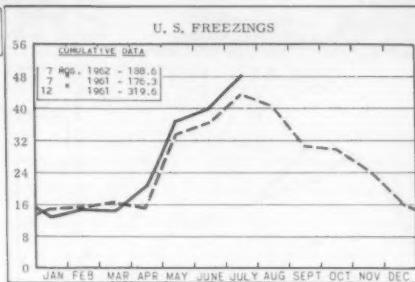


**CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS
of FISHERY PRODUCTS ***

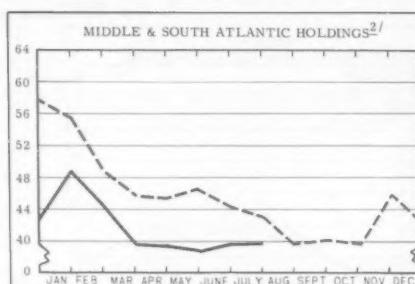
In Millions of Pounds



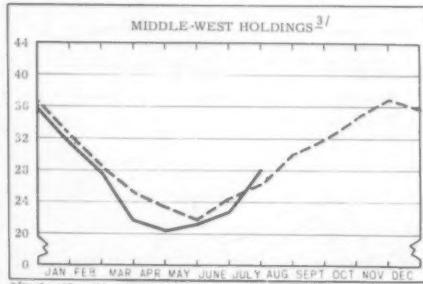
LEGEND
— 1962
- - - 1961



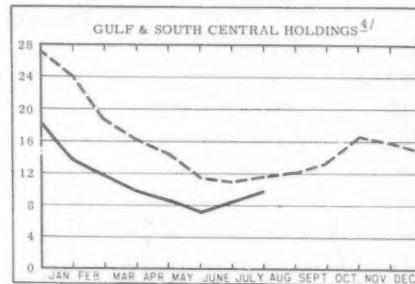
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



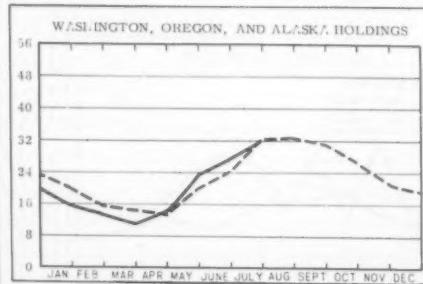
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



* Excludes salted, cured, and smoked products.

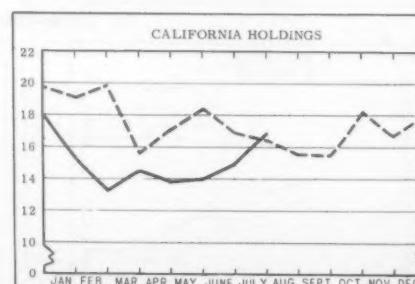
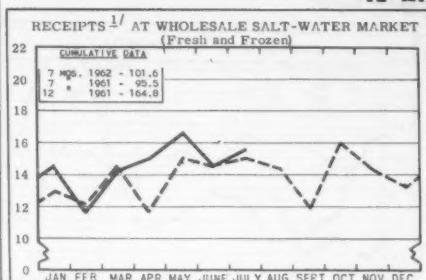


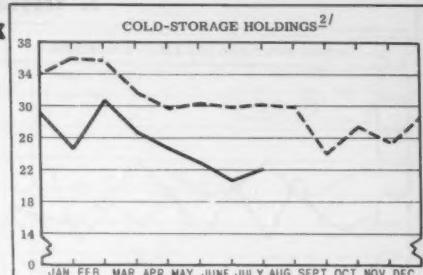
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

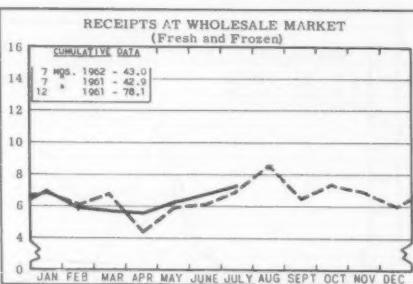


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS
AT NEW YORK CITY.

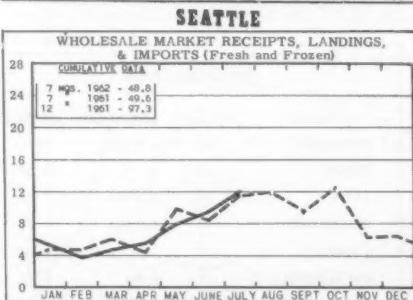
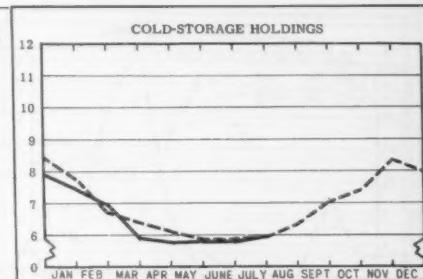
NEW YORK CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
— 1962
- - - 1961

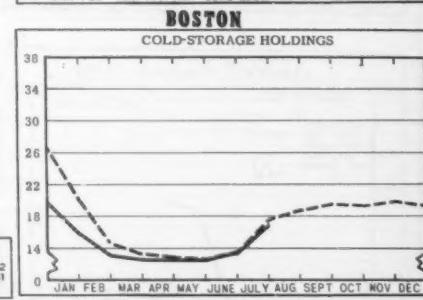


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

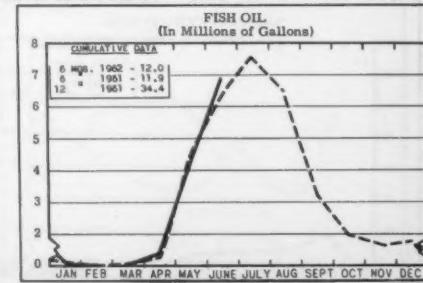
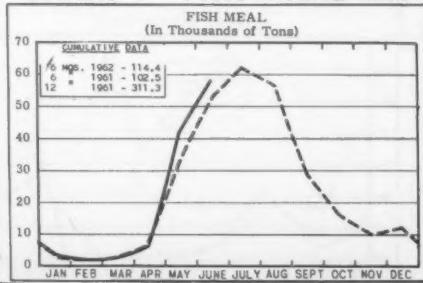
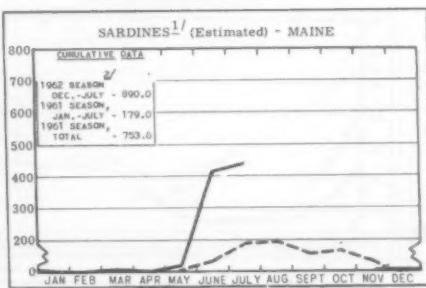
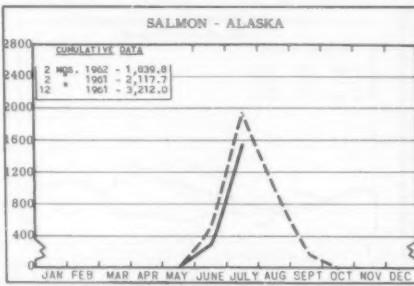
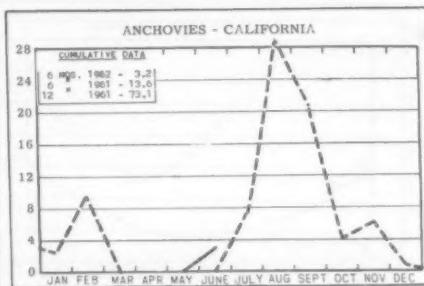
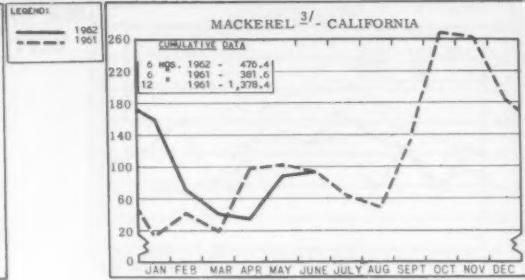
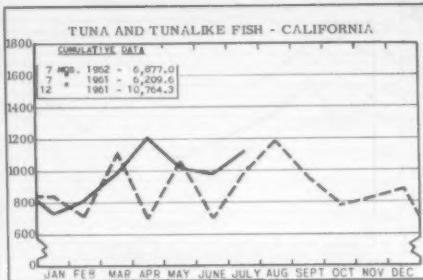


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES....	100	1/4 drawn	3 1/2 oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# 1/2 tuna	6 & 7 oz.
PILCHARDS...	43	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	1/2 lb.	8 oz.

^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

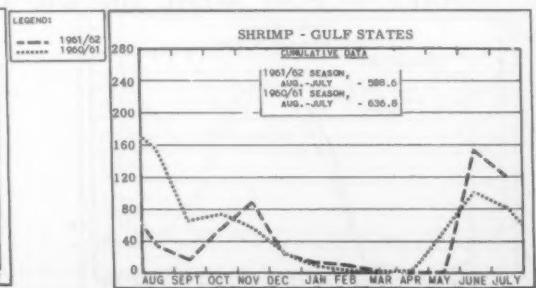
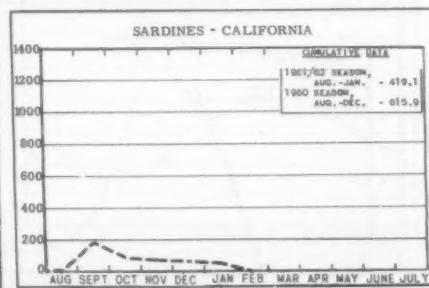
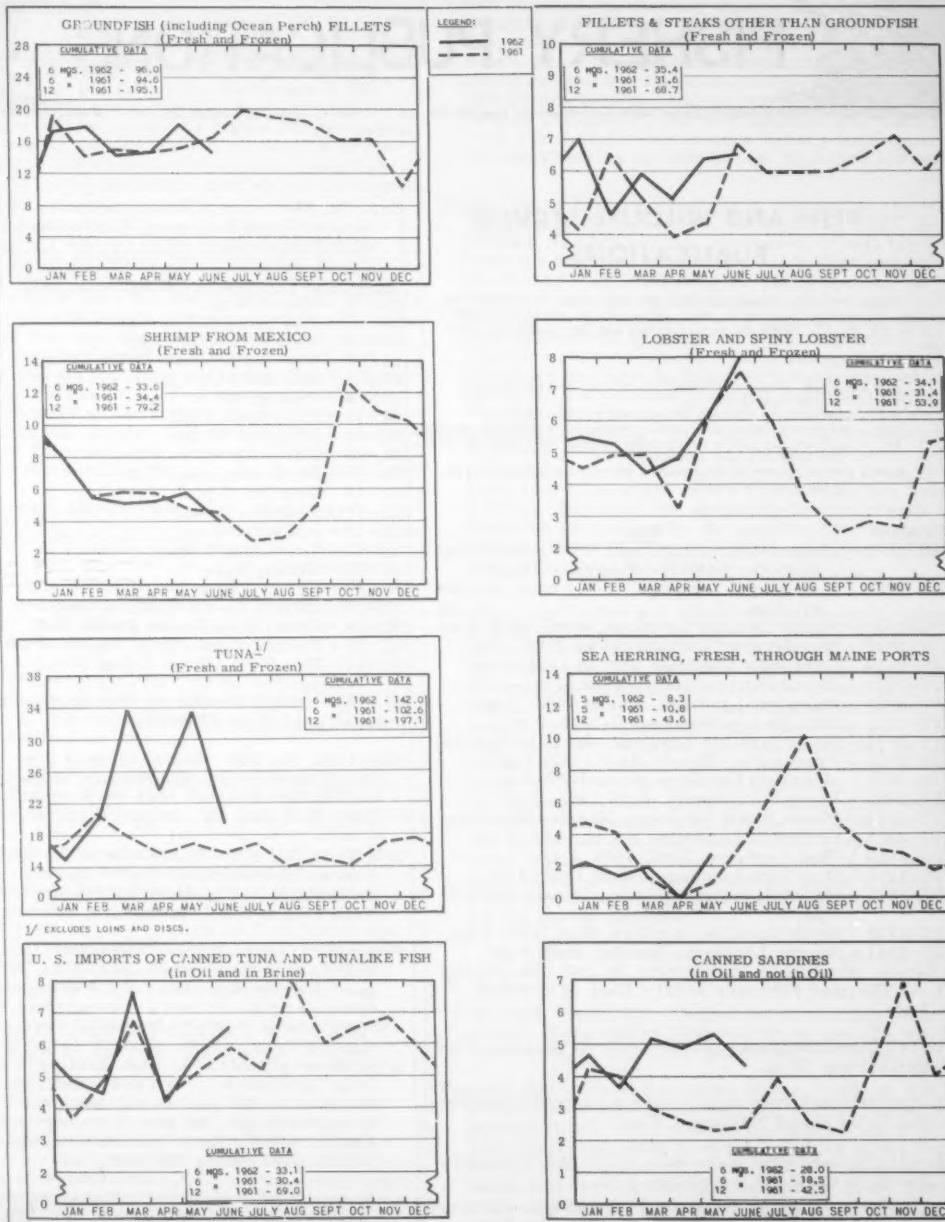


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|--------------------------------|---|
| CFS-2878 | - Massachusetts Landings, 1961 Annual Summary (by Gear and Subarea), 14 pp. |
| CFS-2906 | - Mississippi Landings, 1961 Annual Summary, 5 pp. |
| CFS-2910 | - North Carolina Landings, April 1962, 4 pp. |
| CFS-2912 | - New Jersey Landings, April 1962, 3 pp. |
| CFS-2914 | - California Landings, March 1962, 4 pp. |
| CFS-2915 | - Ohio Landings, March 1962, 2 pp. |
| CFS-2917 | - Maryland Landings, March 1962, 3 pp. |
| CFS-2918 | - Georgia Landings, April 1962, 2 pp. |
| CFS-2919 | - South Carolina Landings, April 1962, 2 pp. |
| CFS-2920 | - Frozen Fish Report, May 1962, 8 pp. |
| CFS-2922 | - Maryland Landings, April 1962, 3 pp. |
| CFS-2923 | - Virginia Landings, April 1962, 3 pp. |
| CFS-2924 | - Rhode Island Landings, March 1962, 3 pp. |
| CFS-2925 | - Louisiana Landings, March 1962, 2 pp. |
| CFS-2926 | - Ohio Landings, April 1962, 2 pp. |
| CFS-2928 | - New York Landings, April 1962, 4 pp. |
| CFS-2933 | - Massachusetts Landings, January 1962, 4 pp. |
| CFS-2935 | - South Carolina Landings, May 1962, 2 pp. |
| CFS-2941 | - Shrimp Landings, January 1962, 6 pp. |
| FL-57 (Revised February 1962) | - Care of Goldfish, 7 pp. |
| FL-147 (Revised January 1962) | - List of National Fish Hatcheries, 10 pp. |
| FL-315 (Revised February 1962) | - Aquarium Construction in the Home Workshop, 7 pp. |
| FL-481 (Revised February 1962) | - The Use of Aquatic Plants in the Home Aquarium, 4 pp. |
| Sep. No. 653 | - Aspects of World Trade of Interest to the Fishery Industries. |

Sep. No. 654 - Use of Environmental and Economic Factors to Check Biological Fluctuations in Maine Lobster Population.

Wholesale Dealers in Fishery Products, 1962 (Revised)

- SL- 1 - Maine, 8 pp.
- SL- 2 - New Hampshire, 1 p.
- SL- 3 - Massachusetts, 9 pp.
- SL- 6 - New York Coastal Area, 10 pp.
- SL- 7 - New Jersey, 5 pp.
- SL- 8 - Pennsylvania, 3 pp.
- SL-10 - Maryland, 9 pp.
- SL-12 - Virginia, 12 pp.
- SL-13 - North Carolina, 6 pp.
- SL-14 - South Carolina, 3 pp.
- SL-15 - Georgia, 3 pp.
- SL-16 - Florida, 14 pp.
- SL-17 - Alabama, 3 pp.
- SL-19 - Louisiana, 7 pp.
- SL-20 - Texas, 6 pp.
- SL-22 - Oregon, 2 pp.
- SL-27 - Indiana (Great Lakes Area), 1 p.
- SL-29 - Ohio (Great Lakes Area), 3 pp.
- SL-30 - Pennsylvania (Great Lakes Area), 1 p.
- SL-31 - New York (Great Lakes Area), 2 pp.

SL-162 - Firms Producing Fish Sticks and Fish Portions, 1961, 3 pp. (Revised)

SSR-Fish. No. 398 - Distribution of Fish Eggs and Larvae, Temperature, and Salinity in the Georges Bank-Gulf of Maine Area, 1953, by Robert R. Marak and John B. Colton, Jr., 64 pp., illus., November 1961.

SSR-Fish. No. 402 - Variations in the Dissolved Oxygen Content of Intragravel Water in Four Spawning Streams of Southeastern Alaska, by William J. McNeil, 17 pp., illus., processed, February 1962.

Progress in Sport Fishery Research, 1961, Circular 132, 93 pp., illus., processed, 1962. This report of sport fishery research for the calendar year 1961 discusses fish viruses and hepatomas, enzyme systems, amino acid requirements, hematocrits and stamina tests, quality control, estuarine research, hormone stimulation, "fish farming" and "fish control," lake productivity, pesticides, electrofishing, and equilibrium yields—all descendants, of the work of earlier years, but new in concept and approach. Also includes a list of publications and special reports issued during the year.

A Report to the Congress on the Federal Aid in Fish Restoration Program for Fiscal Year 1961, 4 pp., processed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE
BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH
AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number Title

- MNL- 7 - Mexican Fisheries, 1961.
MNL-53 - Fisheries of Honduras, 1961.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE
SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, May 1962, 8 pp. (Market News Service, U.S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary.

Part I - Fishery Products Production and Market Data, May 1962, 16 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; for the month indicated.

California Fishery Market News Monthly Summary,

Part II - Fishing Information, June 1962, 9 pp., illus. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, P.O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

"Fish Behavior Investigations," by R. Livingstone, Jr., Circular No. 99, pp. 42-43, illus., printed, 1960. (Bureau of Commercial Fisheries, Biological Laboratory, Woods Hole, Mass.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, May and June 1962, 8 pp. each. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June 1962, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, May 1962, 21 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1961, by William N. Kelly, 22 pp., processed. (Available free from the Market News Service, U.S. Fish and Wildlife Service, 18 South King St., Hampton, Va.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers in the specific areas mentioned. Catch and production data of fishery products in this report were obtained currently for the selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics in this summary represent partial commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual state, or the Chesapeake Bay area as a whole. However, the statistics do show trends in fisheries production for the specific area designated and do reflect the over-all production trend by species, localities, and states.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, June 1962, 9 pp. (Market News Service, U.S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; imports from other countries through Washington Customs District; for the month indicated.

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"Aluminum Punch Strip Method for Measuring Fish," article, Progressive Fish-Culturist, vol. 24, no. 2, April 1962, p. 87, illus., processed, 25 cents.

Fishery Statistics of the United States, 1960, by E.A. Power, Statistical Digest No. 53, 531 pp., illus., printed, \$2.75, 1962. The latest in a series of annual statistical reports on the fisheries of the United States contains data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the

production of manufactured fishery products and by-products. A special feature is a review of the Pacific Coast halibut fishery for the years 1888 to 1960.

The 1960 commercial fisheries of the United States yielded a catch of 4.9 billion pounds valued at \$353.6 million to the fishermen. Only in 1956, when a record 5.3 billion pounds were taken, and in 1959 (5.1 billion pounds) was the annual harvest greater. Compared with 1959, the catch was down 180 million pounds or 4 percent while the value was up over \$7 million or 2 percent. The average price paid to fishermen in 1960 was 7.2 cents per pound--a little higher than in the previous year.

Sharp declines in landings of menhaden, Alaska herring, Pacific sardines, squid, and miscellaneous species used in the manufacture of industrial products resulted in the reduced volume. Increases occurred in catches of Pacific salmon, yellowfin tuna, jack mackerel, crabs, and Maine herring.

Menhaden continued to rank first in volume--a position it had held continuously since 1946. The catch of 2 billion pounds--41 percent of the total U.S. production of all species of fish and shellfish, etc.--was 184 million pounds less than in 1959; however, it was the third largest catch in the history of the fishery.

In 1960, the Pacific Coast tuna fishery recovered from the chaotic conditions of the previous year. Landings totaled 288 million pounds--20 million pounds more than in 1959. Outstanding in the economic recovery of the tuna fishery was the spectacular success of clippers converted to seiners. Tuna seiners were more efficient and economical, taking larger catches in less than one-half the time required by tuna clippers.

Shrimp continued to yield more revenue to U.S. fishermen than any other species. The catch amounted to 249 million pounds, with an ex-vessel value of nearly \$67 million. The volume was up 9 million pounds and the value \$9 million compared with the previous year. Despite increased catches during 1960, the industry was still greatly concerned over the continuing rise in imports which totaled a record 113 million pounds. Primarily through the National Shrimp Congress, the industry continued its effort to have legislation enacted that would provide for an orderly flow of imports.

The 1960 Pacific salmon catch totaled 235 million pounds valued at \$45 million--much better than in 1959 when 202 million pounds valued at \$36 million were landed. However, only in Western and Central Alaska was the season really successful. In some areas, the fishery was nearly a failure.

Red salmon returned to Bristol Bay, Alaska, in near record numbers in 1960. The total run, estimated at well over 35 million fish, yielded a catch of about 13.5 million fish, of which almost 10 million were taken in the Naknek-Kvichak area. Over 20 million fish (perhaps a new record) escaped capture and reached spawning grounds.

Once again, the California sardine season was a failure. The catch dropped from 74 million pounds in 1959 to only 58 million pounds in 1960--the fourth

smallest catch since 1915. There was no lack of interest in fishing, and weather did not limit activities. Sardines just failed to appear in appreciable quantities. High surface water temperatures were believed, at least partially, to be the cause of poor showing of sardines during most of the season.

San Pedro, Calif., was the leading fish landing port in the U.S. in 1960 with respect to both volume and ex-vessel value. Total landings in the San Pedro area, consisting largely of tuna, jack and Pacific mackerel and sardines, amounted to 375 million pounds valued at nearly \$33 million. Pascagoula, Miss., a menhaden port, was in second place with landings of about 302 million pounds, followed by Lewes, Del., with landings of around 282 million pounds, chiefly menhaden. The menhaden ports of Empire and Cameron, La., were next with landings of 216 million pounds and 205 million pounds, respectively. Gloucester, Mass., was in sixth place with landings totaling 192 million pounds, consisting mainly of whiting, ocean perch, and industrial fish. New Bedford, Mass., was in second place with respect to ex-vessel value of landings (over \$13 million), followed by Boston, Mass. (\$9.6 million), and Gloucester, Mass. (\$6 million). The predominance of high-priced sea scallops and flounders in the New Bedford receipts accounted for the high value, although the volume was much less than at other leading ports.

Improving Sport Fishing by Control of Aquatic Weeds, by Eugene W. Surber, Circular 128, 53 pp., illus., processed, 35 cents, 1961. A publication to aid fishery biologists, pond owners, and others who are having problems with aquatic weeds. Large amounts of either submersed or emergent vegetation in fishing waters often interferes with anglers' efficiency, and also leads to overpopulation of stunted fish. The author points out that one of the best ways to control submersed or underwater plants in shallow ponds is to apply fertilizer to the water. The fertilizer encourages the growth of microscopic green or blue-green plants called algae. This free-floating algae, when it becomes dense enough, shades out the larger plants. Many aquatic plants, however, cannot be easily controlled by fertilization, and the algae itself can become a problem. In these cases, chemical control can be effective. A list of aquatic plants and the chemicals that control them is included. Methods of application are discussed and easy-to-follow instructions on measuring the volume of water to determine the rate of application also are included. Various mechanical methods of control are mentioned, including cutting bars and hand-operated weed-cutting saws.

"An Interim Report on Sacramento River Chinook Disease: A Viruslike Disease of Chinook Salmon," by Thomas J. Parisot and John Pelnar, article, Progressive Fish-Culturist, vol. 24, no. 2, April 1962, pp. 51-55, illus., processed, 25 cents.

"Predation of Crayfish on Fishes," by W.L. Minckley and James E. Craddock, article, Progressive Fish-Culturist, vol. 23, no. 3, 1961, pp. 120-123, processed, 25 cents.

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AMINO ACIDS:

"Studies on the External Mucous Substance of Fishes. III-Identification of Amino Acids in the Mucus Protein from Some Fishes by Paper Chromatography," by Noriyuki Enomoto, Tadaaki Nagao, and Yukio Tomiyasu, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, no. 2, 1961, pp. 143-146, printed. Japanese Society of Scientific Fisheries, 6-Chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

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ANIMAL NAVIGATION:

"Animal Navigation in the Sea," by Talbot H. Waterman, article, *Gunma Journal of Medical Science*, vol. 8, no. 3, 1961, pp. 243-262, printed. Gunma University Medical Library, Maebashi-shi, Japan.

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"Applicability of Antioxidant to Marine Products," by K. Toyama, K. Saruya, and K. Ando, article, *Journal of Tokyo University of Fisheries*, vol. 46, no. 1/2, 1960, pp. 107-131, illus., printed. Tokyo University of Fisheries, Shiba Kaigandori, 6-Chome, Minato-Ku, Tokyo, Japan.

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and A.M. Fleming, "On the Fecundity of Pacific Cod (*Gadus macrocephalus Tilesius*) from Hecate Strait, British Columbia," by J. Arthur Thomson; and "A Note Concerning the Origin and Quantitative Distribution of Acid-Soluble Phosphorus Compounds and Free Sugars in Fish Muscle," by H.L.A. Tarr and M. Leroux.

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Synopsis of Biological Data on Cod, GADUS MORHUA Linnaeus, 1758, by John P. Wise, FAO Fisheries Biology Synopsis No. 21, FB/S21, SAST-Cod-1,48 (4), 0,02, 02, 53 pp., illus., processed (limited distribution). Fisheries Division, Biology Branch, Food

and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, December 1961. This is one of a series of synopses of biological data concerning species of aquatic organisms of economic importance. It is a revision of an unpublished life history summary on cod prepared originally for the U.S. National Academy of Sciences Handbook of Biological Data. It discusses the identity of the species, distribution, bionomics and life history, population, and exploitation. Also contains a complete list of references.

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President Kennedy's Message on Conservation to the Congress of the United States, 20 pp., illus., printed, 20 cents. U.S. Department of the Interior, Washington, D.C., March 1, 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Presents a bold and far-seeing message on conservation which President Kennedy sent to Congress on March 1, 1962. Defines the creative relationships between man and the whole spectrum of earth, air, and water resources on which he depends. An unprecedented charter for vigorous action and a specific program for the future. Many kinds of resources, such as energy and metals, forests and forage, soils and water, fisheries and wildlife, are considered here, not only separately, but in that combination which makes up our natural environment.

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FOOD:

Fish as Food, vol. 1, edited by Georg Borgstrom, 726 pp., printed, \$24. Academic Press, 111 Fifth Ave., New York 3, N.Y., August 1961. This is the first of three volumes designed to give an up-to-date account of the world's resources of fish, shellfish, and other aquatic organisms suitable for food and feed, their present exploitation and future potentialities. Most of the world's leading fish scientists have contributed to the volumes. Of particular importance is the inclusion of Soviet and Japanese investigations previously unavailable in English. The book is a valuable source of information for all those engaged in the study of marine and fresh-water organisms utilized as food. It also includes valuable and abundant information for the chemist, biologist, bacteriologist, and food technologist concerned with food commodities other than fish. The contents are as follows: Biology of Seafish Production; World Fisheries; Fish Cultivation in Europe; Carp Cultivation in Japan; Raising Fish for Food in Southeast Asia; Organic Constituents of Fish and Other Aquatic Animal Foods; Biochemistry of Fish Oils; Recent Findings in Fatty Acid Composition of Marine Oils; Fish Proteins with Special Reference to Freezing;

The Histamine Problem; Nonprotein Nitrogenous Compounds; Rigor Mortis in Fish; Vitamins in Fish--with Special Reference to Edible Parts; The Microbiology of Sea-Water Fish; Microbiology of Shellfish Deterioration; The Spoilage of Fresh-Water Fish; and Chemical Control of Microbiological Deterioration. Special lists of species mentioned in the text, prepared in a Latin and English arrangement are appended. The contents of vol. II and vol. III are also listed in the present volume.

FOOD CONSUMPTION:

Dietary Evaluation of Food Used in Households in the United States, by Corinne LeBovit and others, Household Food Consumption Survey 1955, Report No. 16, 60 pp., illus., printed, single copy 40 cents. Household Economics Research Division, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C., November 1961. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) Fish included in tables only in the basket category of "meat, poultry, fish."

FOOD STORAGE:

Storing Perishable Foods in the Home, Home and Garden Bulletin No. 78, 12 pp., illus., printed, 10 cents. U.S. Department of Agriculture, Washington, D.C., October 1961. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) This booklet offers specific storage suggestions for foods, including fish. Discusses indication of food spoilage, variations in the degree of temperature and the amount of moisture needed to retain quality in storage, temperatures in the refrigerators, and storage directions for all foods. Fish may be stored in the coldest part of the refrigerator for one or two days. Loose wrappings are suggested as fish benefit from some circulation of air.

FOREIGN TRADE:

"Here are FCIA's Questions, Answers on Foreign Credit Insurance Plan," article, Foreign Commerce, vol. 67, no. 13, March 26, 1962, pp. 495-500, printed. Foreign Credit Insurance Association, 60 John St., New York 38, N.Y. Because of the intense interest on the part of American exporters in the new export credit procedures of the Export-Import Bank's Foreign Credit Insurance Association (FCIA), detailed information prepared by FCIA is reprinted in a question-and-answer form. Included also are samples of FCIA's Short Term-Shipment form.

FRANCE:

"Une Annee de Peche Francaise--Le Rapport sur l'Activite du Comite Central des Peches Maritimes en 1961" (One Year of French Fishing--Report on the Work of the Central Committee of Maritime Fisheries in 1961), and "L'Activite des Comites Interprofessionnels" (Activity of the Interprofessional Committees), by J.S. Parquier, articles, France Peche, vol. 7, no. 62, April 1962, pp. 27-30, 32, 34, 36, 38, 40, 42, 44, 46, 48-49, and vol. 7, no. 63, May 1962, pp. 62, 65-66, 69-70, 73, printed in French. France Peche, Boite Postale 179, Lorient (Morbihan), France.

"Extraits du Rapport final presente par la commission des Peches maritimes du Quatrieme Plan" (Extracts

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of the Final Report Presented by the Commission of Maritime Fisheries of the Fourth Plan, article, France Peche, no. 58, January 1962, pp. 13-14, printed in French. France Peche, Boite Postale 179, Lorient (Morbihan), France.

"La Position des Peches Francaises" (Status of French Fisheries), by Jules Molard, article, France Peche, vol. 7, no. 61, April 1962, pp. 15-16, printed in French. France Peche, Boite Postale 179, Lorient (Morbihan), France.

"Reflexions sur la densite des especes" (Considerations on the Abundance of the Species), by Robert Lenier, article, France Peche, no. 58, January 1962, pp. 17-19, illus., printed in French. France Peche Boite Postale 179, Lorient (Morbihan), France.

"Une Saison de prospection du Roselys" (A Season of Exploration by the "Roselys"), article, France Peche, no. 58, January 1962, pp. 40-42, illus., printed in French. France Peche, Boite Postale 179, Lorient (Morbihan), France.

"La Situation de l'Industrie de la Conserve du Thon et de la Sardine Avant la Campagne de 1962" (Status of the Tuna and Sardine Canning Industry Before the 1962 Season), by A. de Torquat, article, La Peche Maritime, vol. 41, no. 1010, May 1962, pp. 295-296, illus., printed in French. La Peche Maritime, 190 Boulevard Haussman, Paris, France.

FREEZE-DRYING:

"Accelerated Freeze-Drying in Fish Processing," by E.A.M. Bradford, article, The Fishing News, vol. 1, no. 1, October 1961, pp. 102, 105-106, illus., printed. The Fishing News, Suite 27, 110 Fleet St., London EC4, England.

"Freeze-Drying Takes First Giant Step," article, Quick Frozen Foods, vol. 23, no. 11, pp. 43-45, illus., printed. E.W. Williams Publications, Inc., 82 Wall St., New York 5, N.Y.

"How Liana Freeze-Dries Shrimp and Plans Full Line of Sublimated Food Products," by K.A. Andersen, article, Canner and Packer, Western Edition, vol. 130, July 1961, pp. 23-24, illus., printed. Tried Publishing Co., 59 East Monroe St., Chicago 3, Ill.

"Prospect for Freeze-Drying," article, Modern Refrigeration, vol. 64, no. 760, July 1961, pp. 690-692, illus., printed. Refrigeration Press Ltd., Maclarens House, 131 Great Suffolk St., London SE1, England.

FREEZING:

"Associated Fisheries' New Trawler Can Freeze Half Her Catch at Sea," article, Frozen Foods, vol. 14, no. 7, July 1961, pp. 476-477, illus., printed. Maclarens House, 131 Great Suffolk St., London SE1, England.

"Freezing on Board Ship is a Logical Step Forward," by G.C. Eddie, article, Frozen Foods, vol. 14, no. 9, September 1961, pp. 646-650, 660, printed. Maclarens House, 131 Great Suffolk St., London SE1, England.

Freezing on Board, Some Factors Affecting Design of Vessel and Choice of Equipment, by G.C. Eddie, Torry Report No. 1, 11 pp., printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Optimal'nye Uslovija Zamorazivaniya Ryby v Potoku Vozduha" (Optimum Conditions for Freezing Fish in an Air Blast), by G.S. Konokotin, article, Kholodil'naja Tekhnika, no. 5, 1961, pp. 53-58, illus., printed in Russian. Four Continent Book Corp., 822 Broadway, New York 3, N.Y.

FROZEN FISH:

"Frozen Fish: Marinated Fillets of Salt Herring; Fillets of Spiced Herring," article, 1960 Beretning, Fiskeriministeriets Forsøgslaboratorium, pp. 43-45, printed in Danish and English. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1961.

"Frozen Fish: Shrimp," article, 1960 Beretning, Fiskeriministeriets Forsøgslaboratorium, p. 42, printed. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1961.

"Microbiology of Frozen Seafoods," article, Frosted Food Field, vol. 32, no. 4, April 1961, pp. 31-32, illus., printed. Frosted Food Field, 321 Broadway, New York 7, N.Y.

"Quick-Thawing Frozen Fish," article, The Fishing News, vol. 1, no. 1, October 1961, pp. 108-109, illus., printed. The Fishing News, Suite 27, 110 Fleet St., London EC4, England.

FROZEN STORAGE:

"Tiefkuhllhaus in Leichtbauweise fur Gefrierfischlagerung" (A Cold Store of Light Structure for the Storage of Frozen Fish), by H.J. Eckert, article, Kaltetechnik, vol. 12, no. 7, July 1960, pp. 196-199, illus., printed in German. Verlag C.F. Muller, Karlsruhe, Germany.

GENERAL:

"All About Fish," by Howard Zeller, article, Georgia Game and Fish, vol. 11, no. 1, pp. 10-11, illus., printed. Georgia Game and Fish Commission, 412 State Capitol Bldg., Atlanta, Ga. Discusses the basic scientific knowledge of fish as an animal group such as classification, vision of fish, sense of smell and touch, hearing, and internal anatomy. Includes also some fishing tips.

GERMAN FEDERAL REPUBLIC:

Bericht über Stellung und Lage der Seefischerei der Bundesrepublik Deutschland (Report on the Position and Status of Marine Fisheries of the Federal Republic of Germany), Deutscher Bundestag--4. Wahlperiode, Drucksache IV/230, 35 pp., illus., printed in German. Der Bundesminister für Ernährung, Landwirtschaft und Forsten, Bonn, Germany, February 28, 1962. Reviews the status of the West German fishing industry and proposes a considerable increase in government aid in the form of subsidies and loans.

GILL NETS:

"Selectivity and Efficiency of Experimental Gill Nets in South Bay and Georgian Bay of Lake Huron," by

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A.H. Berst, article, *Transactions of the American Fisheries Society*, vol. 90, no. 4, 1961, pp. 413-418, printed. Secretary, American Fisheries Society, P.O. Box 483, McLean, Va.

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Synopsis of Biological Data on Groupers (EPINEPHELUS and Allied Genera) of the Western North Atlantic, by C. Lavett Smith, FAO Fisheries Biology Synopsis No. 23, FB/S23, SATS-Groupers-1,70 (2), 65 pp., illus., processed (limited distribution). Fisheries Division, Biology Branch, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, December 1961. This is one of a series of synopses of biological data concerning species of aquatic organisms of economic importance. Discusses the identity of the species, distribution, bionomics and life history, population, and exploitation. Also contains a complete list of references.

HAKE:

"Size Distribution by Depth of the Longfin Hake, *Phycis chesteri*," by Raymond L. Fritz, article, *Copeia*, no. 2, 1961, pp. 229-230, printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

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Memorandum on 1962 Pacific Halibut Fishery Regulations, 2 pp., processed. International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash. Lists the significant changes of the 1962 regulations from those of 1961.

Pacific Halibut Fishery Regulations (Effective March 27, 1962), 11 pp., printed. International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash., March 1962. These regulations were published in conformity with the Pacific Halibut Fishery Convention between the United States and Canada, signed March 2, 1953. They are based on biological and statistical investigations, designed to show what catch can be taken from the stocks each year. Lists the regulatory areas and length of the halibut fishing seasons, and discusses closed seasons, catch limits, size limit, and licensing of vessels. Also covers conditions limiting validity of permits, statistical return by vessels and dealers, dory gear and nets prohibited, retention of tagged halibut, responsibility of master, supervision of unloading and weighing, and sealing of fishing equipment.

ICELAND:

"Rannsoknir a veidum med dragnt vorid 1961" (Comparative Fishing with Danish Seine, Spring 1961), by C.P. Joakimsson, article, *Aegir*, vol. 54, no. 16, 1961, pp. 325-327, illus., printed in Icelandic with English summary. Fiskifelag Islands, Reykjavik, Iceland.

ICE STORAGE:

"Influence of Various Factors on Keeping Quality of Fish and Changes in Nitrogen Distribution and Texture of Fish During Storage in Ice," by M.N. Moorjani, article, *Food Science*, July 1961, pp. 201-212, printed. Central Food Technological Research Institute, Mysore, India.

IMPORTS:

United States Imports of Merchandise for Consumption (Commodity by Country of Origin), Calendar Year 1961, Report No. FT 110, 204 pp., illus., processed, \$1. Bureau of the Census, U.S. Department of Commerce, Washington, D.C., May 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) The import statistics include government as well as nongovernmental shipments of merchandise (including fish, shellfish, and fishery byproducts) from foreign countries.

INTERNATIONAL COMMISSIONS:

"Colaboracion con la Comision Internacional de Pesquerias del Atlantico Noroeste (ICNAF)" (Collaboration with the International Commission for the Northwest Atlantic Fisheries--ICNAF), by O. Rodriguez, article, *Boletin de la Real Sociedad Espanola de Historia Natural*, vol. 58, no. 2, 1960, pp. 314-334, illus., printed in Spanish. Real Sociedad Espanola de Historia Natural, Paseo de la Castellana, 84, Madrid, Spain.

IRRADIATION PRESERVATION:

"Food Preservation Research in Sweden," by L.E. Ericson, article, *Food Irradiation Quarterly International Newsletter*, vol. 2, no. 2, October-December 1961, pp. A2-A5, printed. O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW., Washington 6, D.C.

"Zur Problematik der Strahlenkonservierung von Lebensmitteln" (Preservation of Foodstuffs by Means of Irradiation), by J. Kuprianoff, article, *Atomenergie*, vol. 4, 1959, pp. 296-299, printed in German. Karl Thiemig KG, Pilgersheimer Strasse 38, Munich 9, Germany.

"The Revised U.S. Army Quartermaster Corps Program on Food Preservation by Ionizing Energy," by William B. Levin, article, *Food Irradiation Quarterly International Newsletter*, vol. 2, no. 2, October-December 1961, pp. A6-A9, printed. O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW., Washington 6, D.C.

JAPAN:

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 10, December 1961, 130 pp., illus., printed in Japanese with English summaries. Includes, among others, the following articles: "Studies on the Radiological Contamination of Fishes, Sea Water and Plankton in the Southern Region of Kagoshima Prefecture during the Period from November 1959 to December 1960," by Muney Sameshima and Saito Kaname; "On the Proteolysis and Coagulation of Actomyosin Fraction of Fish Muscle by Action of Bacterial Proteinase," by Tomio Hidaka; "Studies on the Vitamin B-complex in Marine Algae, I-On Vitamin Contents," by Akio Kanazawa; "Studies on the Tanning of Fish Skin," by Michitoshi Ochi; "On the Relation Between Body-Temperature of Mackerel 'Gomasaba' and Its Fishing Depth," by Toyotaka Tanoue; "Experiments Performed in a Large Circulating Tank on a Model of a Fishing Vessel of Gross Tonnage About 1,000 Tons," by Yoshikazu Narasaki; and "On the Building Cost of Kagoshima-Maru, Fisheries Training Ship, Kagoshima University," by Kenzo Takahashi.

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Korean Exports, 1962, 206 pp., illus., printed, Chamber of Commerce of Korea, 111 Sokong-dong, Seoul, Korea, 1962. Deals with the annual investigation into actual conditions of Korean exports conducted for the purpose of introducing Korea's exports to foreign countries. Part 1 includes, among others, a section on the fishing industry--one of the major industries of Korea. This section gives a general description of the fishing industry, and an analysis of Korea's fisheries export market. Quantity and value of fishery products exports for 1960 are also included. Part 2 contains general trade information, and Part 3 is a trade directory listing exporters, manufacturers, and associations.

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"Recoveries of Tagged, Hatchery-Reared Lake Trout from Lake Superior," by Howard J. Buettner, article, Transactions of the American Fisheries Society, vol. 90, no. 4, 1961, pp. 404-412, printed. Secretary, American Fisheries Society, P.O. Box 483, McLean, Va.

LAMPREY:

"Colorimetric Determination of Halogenated Nitrophenols Added to Streams as Sea Lamprey Larvicides," by M.A. Smith, V.C. Applegate, and B.G.H. Johnson, article, Analytical Chemistry, vol. 32, 1960, pp. 1670-1675, printed. American Chemical Society, 1155 16th St., NW, Washington 6, D.C.

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Synopsis of Oregon Boating Laws and Regulations, 23 pp., printed. Oregon State Marine Board, Salem 10, Oreg., February 1, 1961. Outlines the boating laws and regulations of the State of Oregon for the purpose of making the waters safer for boaters and other users. Includes information regarding registration, duties of State Marine Board and disposition of fees, equipment requirements, and general information on lights and equipment. Also includes information on rules of right of way, illegal operation, local regulations, law enforcement, and related information.

LOUISIANA:

An Ecological Survey of Factors Affecting Fish Production in Louisiana Waters, by Donald W. Geagan and Thomas D. Allen, Dingell-Johnson Project F-6-R Louisiana, 100 pp., printed. Louisiana Wild Life and Fisheries Commission, Fisheries Section, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La., 1960.

MACKEREL:

"Consideraciones acerca del crecimiento de la Caballa (Scomber scombrus L.)" (Considerations on the Growth of Mackerel, Scomber scombrus L. in the Spanish Mediterranean) by C. Bas, article, Investigación Pesquera, vol. 16, 1960, pp. 33-90, illus., printed in Spanish with English summary. Investigación Pesquera, University of Barcelona, Spain.

MARINE SCIENCES:

Marine Sciences Instrumentation, by Roy D. Gaul and others, vol. I, 354 pp., illus., printed, \$12.50, Plenum Press, 227 W. 17th St., New York 11, N.Y. Collection of instrumentation papers presented at the Marine Sciences Conference, 1961, at Woods Hole, Mass.

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"Badania mikrobiologiczne ryb w toku manipulacyjnym" (Microbiological Analysis of Fish During Processing), by S. Niewolak, article, Zeszyty Naukowe Wydziału Szkół Rolniczych w Olsztynie, vol. 10, no. 84, 1960, pp. 1-21, printed in Polish with English and Russian summaries. Wydawnictwo WSR w Olsztynie, Olsztyn, Poland.

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NAVIGATION:

Rules of the Road, Great Lakes, CG-172, 66 pp., printed. U.S. Coast Guard, Treasury Department, Washington 25, D.C., May 1, 1959. Contains navigation requirements which must be followed by vessels navigating upon the Great Lakes and their connecting and tributary waters. Related laws and regulations affecting navigation on the Great Lakes under the cognizance of the Coast Guard, as well as certain pertinent general regulations of the Corps of Engineers, Department of the Army, are also included.

Rules of the Road, International-Inland, CG-169, 93 pp., printed. U.S. Coast Guard, Treasury Department, Washington 25, D.C., May 1, 1959. Contains the amended international Regulations for Preventing Collision at Sea, 1948, which are to be followed by all public and private vessels and seaplanes of the United States while navigating upon the high seas and the rules to prevent collisions to be followed by all vessels while navigating upon certain inland waters of the United States. Related laws and regulations affecting navigation in coastal inland waters under the cognizance of the Coast Guard are also included.

Rules of the Road, Western Rivers, CG-184, 62 pp., printed. U.S. Coast Guard, Treasury Department, Washington 25, D.C., May 1, 1959. Contains the navigation requirements which must be followed by all public and private vessels while navigating on the western rivers. Related laws and regulations are also included.

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Evaluation of Commercial Fishing by Use of a Questionnaire, by Louis H. Carufel, 4 pp., illus., printed.

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(Reprinted from The Progressive Fish-Culturist, vol. 22, no. 4, October 1960, pp. 181-184.) North Dakota Game and Fish Department, Bismarck, N.D. Results of a survey initiated in 1953 of the fishery in the Missouri and Yellowstone Rivers. The survey was initiated at that time in order to secure information before river habitat was lost as a result of the construction of Garrison Dam. Information was compiled regarding commercial utilization, including a comparison of the catches made with various types of gear and a tabulation of the poundage of fish taken.

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"Fish and Unavailable Iron," article, Nutrition Reviews, vol. 19, 1961, pp. 143-144, printed. The Nutrition Foundation, Inc., 99 Park Ave., New York 16, N.Y.

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Common Seashore Life of the Pacific Northwest, by Lynwood Smith, 66 pp., illus., printed, \$3.25; paper, \$1.75. Naturegraph Co. and Naturegames Publishers, 8339 W. Dry Creek Rd., Healdsburg, Calif. Guide to common and conspicuous beach life; describes habits and characteristics.

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PHOTOGRAPHY:

A Technique for Direct Photography of Translucent Objects, by Andrew J. McErlean and Ronald C. Phillips, Contribution No. 57, 2 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 90, no. 4, October 1961, pp. 500-501.) Florida State Board of Conservation Marine Laboratory, St. Petersburg, Fla.

PIKE:

"Propagation of Northern Pike," by Laurence E. Hiner, article, Transactions of the American Fisheries Society, vol. 90, no. 3, 1961, pp. 298-302, printed. Secretary, American Fisheries Society, P.O. Box, 483, McLean, Va.

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L.A. Kuderskii, article, Rybnoe Khoziaistvo, vol. 5, 1960, pp. 15-17, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

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POTOMAC RIVER:

Economic Base Survey of the Potomac River Service Area, 100 pp., illus., printed, 55 cents. Office of Business Economics, U.S. Department of Commerce, Washington, D.C., 1961. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.)

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"Novyi sposob raboty koshel'kovym nevodom" (New Method of Purse Seining), by I.I. Kul'batskii, article, Rybnoe Khoziaistvo, vol. 36, no. 8, 1960, pp. 46-48, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

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"Improvement in Keeping Quality of Fish: Effect of Temperature on Freshness," article, 1960 Annual Report, Torry Research Station, p. 6, printed. Torry Research Station, Aberdeen, Scotland, 1961.

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Storage and Transport of Fish in Refrigerated Sea Water, by S.W. Roach, J.S.M. Harrison, and H.L.A. Tarr, Bulletin No. 126, 68 pp., illus., printed, 75 cents. Fisheries Research Board of Canada, Ottawa, Canada, 1961. (Available from Queen's Printer and Controller of Stationery, Ottawa, Canada.) Describes the refrigerated sea-water method of holding chilled fish. Discusses the engineering aspects of freezing fish; the refrigeration theory; structural require-

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ments and materials used in tanks, condensers, evaporators, pumps, and piping; practical application of the method in different fisheries; physical and chemical changes in fish in ice water; bacteriological spoilage and its control. Also includes two illustrated appendices entitled "Experiments on the Storage of Canadian Atlantic Coast Cod in Refrigerated Sea Water," by W.A. MacCallum and M.S. Chan; and "Chilled Water for the Preservation of Freshwater Fish," by A. W. Lantz.

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Fish Room Insulation and Refrigeration--Some Experiences on a Modern Trawler, by J.J. Waterman, *Torry Research Report No. 2*, 2 pp., printed, *Torry Research Station*, Aberdeen, Scotland, 1961.

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"Refrigerated Brine Storage," article, *Modern Refrigeration*, vol. 64, no. 761, August 1961, p. 824, illus., printed, *Refrigeration Press Ltd.*, Maclarens House, 131 Great Suffolk St., London SE1, England.

"Refrigeration in Fishing Vessels," by G.C. Eddie, article, *World Refrigeration and Air-Conditioning*, vol. 12, no. 9, September 1961, pp. 34-41, 44, printed. *Technical Productions Ltd.*, 140 Cromwell Rd., London SW7, England.

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NATIONAL FISH 'n SEAFOOD PARADE--OCTOBER 1962

In order to encourage the greater use of fish and shellfish products, this year's Fish Seafood Parade will extend throughout the month of October. This is the Fishing Industry eighth annual all-out promotion. Extensive advertising over radio, television, newspapers, national magazines will point out to the consumer that fishery products are healthful and good eating. Three thousand food store executives have been alerted to the campaign. Because of the importance of lemons in the serving of seafoods, the promotion is being actively supported by the Sunkist Growers of California.

National and local publicity will concentrate on consumers, restaurants, and institutions. At the retail level, a poster 38" x 25" will feature the "sailor boy on the fish"--the image which identifies the Annual Fish 'n Seafood Parade.

A new feature of the promotion is the Seafood Plate Contest for the huge institutional food service industry. The contest will create new interest in fishery products and give chefs an opportunity to show their skill--and win a prize. The contest, which



columnists. In addition, the Bureau contacted radio stations throughout the country to request the use of the Bureau's new public service spot announcements and the continued use of previous recorded announcements. Bureau home economists and marketing specialist made personal appearances on radio and television food shows throughout the country.

Past experience shows that each new Parade is more effective than the last. The 1962 promotion is on its way to be the best ever.



runs from September 1 through October 31, has attracted special support and will be nationally advertised by fishery associations. Contest information is even being packed and distributed with institutional fish packs. Additional prizes are being offered by several firms. The contest will cover three categories: (1) pre-cut fish portions; (2) fillets, steaks, and other fish; and (3) shellfish. As its contribution to "Fish 'n Seafood Parade," the U.S. Bureau of Commercial Fisheries nationally distributed consumer educational materials to newspaper editors and other food publicists, public and private schools participating in the National School Lunch Program, restaurants, public and private institutions, in-plant feeders, and the retail food trade. Black and white food photographs were supplied to newspaper food

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